ADDENDUM No. 3

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES

PROJECT NAME: **Frio Bulky Waste Collection Center**

DATE: June 1, 2012

This addendum shall be included in and be considered part of the plans and specifications for the above named project. The contractor shall be required to sign an acknowledgement of the receipt of this addendum and submit with their bid package.

Project No. 5556050002

BIDDER QUESTIONS AND RESPONSES

01) Question: On sheet C-2 there is a note to see Landscape drawings for the electronic gate and emergency entrance manual gate. There are no landscape drawings or details of the gates.

Answer: The landscape drawings and details of the gates are contained in this addendum (Addendum 3).

02) Question: If Alternate No. 1 is chosen, will we need a second temporary job trailer at the Oriental Lot site?

Answer: No. One job trailer located at the Frio site will be required.

03) Question: Who pays for impact fees?

Answer: The City of San Antonio will pay impact fees. Please note the Contractor is required to pay Development Services inspection fees, TCEQ fees for the permit associated with stormwater and construction activities, temporary service fees, and other construction related fees.

04) Question: Who pays for material testing?

Answer: The Contractor will be responsible for all costs of hiring a third party materials testing company to perform material testing as required on the plans and specifications, including applicable sections of the City of San Antonio General Specifications.

DRAWINGS

E-1 Electrical, Power/Lighting Plan Schedule & Details (Revised)

The revised drawing contains electrical requirements for the Frio Bulky Waste Collection Site.

E-3 Electrical, Power/Lighting Plan Schedule & Details (New)

The drawing contains electrical and lighting requirements for the Oriental Lot site. The new drawing should be added to the drawing set.

L-100 Planting Plan (New)

The new drawing should be added to the drawing set.

L-101 Planting Plan (New)

The new drawing should be added to the drawing set.

L-102 Fence and Hardscape Plan (New)

The new drawing should be added to the drawing set.

L-103 Fence Details (New)

The new drawing should be added to the drawing set.

L-104 Fence Details (New)

The new drawing should be added to the drawing set.

L-200 Planting Plan (New)

The new drawing should be added to the drawing set.

L-201 Landscape Materials, Schedule & Planting Details (New)

The new drawing should be added to the drawing set.

L-202 Fence Plan (New)

The new drawing should be added to the drawing set.

IR-200 Irrigation Plan – Turf (New)

The new drawing should be added to the drawing set.

IR-201 Irrigation Plan – Planting Beds (New)

The new drawing should be added to the drawing set.

IR-202 Irrigation Plan – Tree Bubblers (New)

The new drawing should be added to the drawing set.

IR-203 Irrigation Details (New)

The new drawing should be added to the drawing set.

IR-204 Irrigation Details (New)

TP-100 Tree Preservation Plan (New)

The new drawing should be added to the drawing set.

TP-101 Tree Preservation Inventory and Details (New)

The new drawing should be added to the drawing set.

TECHNICAL SPECIFICATIONS

01) The approximate quantities for the masonry walls, columns, and signs (Bid Item No. 24) and fencing/columns (Bid Item No. 32) have been revised on the attached 025 Unit Pricing Form. The description of Bid Item No. 33 was revised from a 22 foot double manual gate to a 30 foot double manual gate.

02) Replace the wage rate determination located at the end of the Form 085, General Conditions, with the attached revised wage rate determinations.

03) Add the attached technical specifications prepared by RVK and Associates titled "Landscape Specifications – Frio Bulky Waste Collection Center" dated May 31, 2012. The added technical specifications include a table of contents and Divisions 3, 4, 07, 31, and 32.

OTHER

01) Add the attached structural details (S1 of 4 through S4 of 4) associated with the electric gate.

02) The original bid issue civil drawings and specifications described the entrance to Saturn Street as a 22 foot swinging double manual gate. This gate shall be a 30 foot sliding double manual gate as specified on the drawings and specifications prepared by RVK Architects.

ATTACHMENTS:

01) Drawings E-1, E-3, L-100, L-101, L-102, L-103, L-104, L-200, L-201, L-202, IR-200, IR-201, IR-202, IR-203, IR-204, TP-100, TP-101
02) Structural Details S1 through S-4
03) Revised 025 Unit Pricing Form
04) Revised Wage Rate Determination
05) Landscape Specifications
06) Addendum Acknowledge Form

END OF ADDENDUM No. 3

The new drawing should be added to the drawing set.

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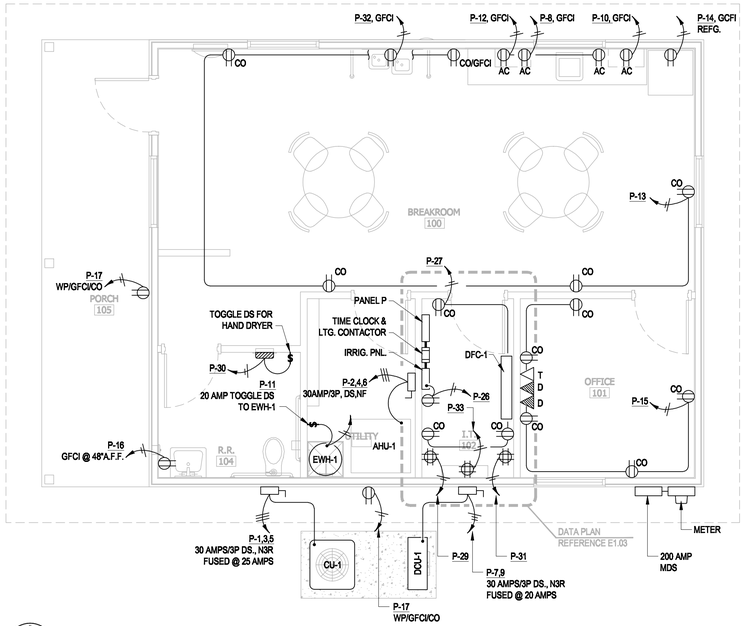
ATTACHMENTS:

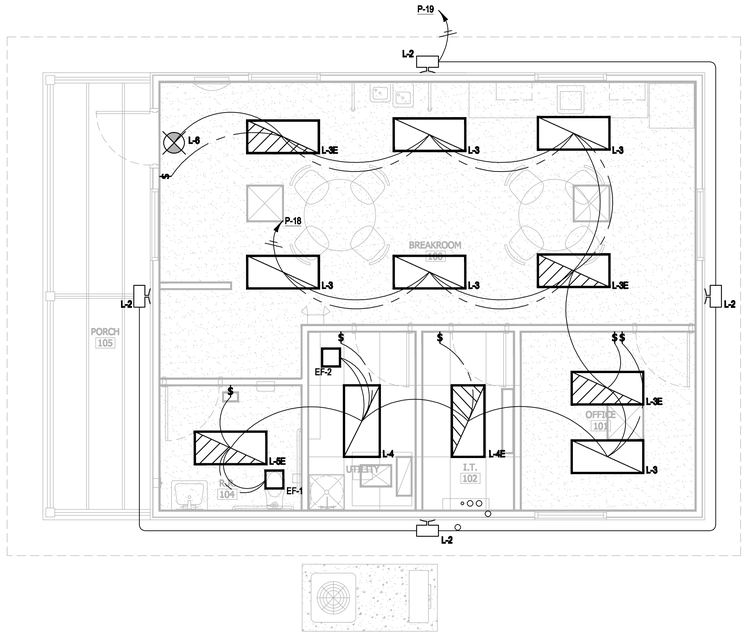
01) Drawings E-1, E-3, L-100, L-101, L-102, L-103, L-104, L-200, L-201, L-202, IR-200, IR-201, IR-202, IR-203, IR-204, TP-100, TP-101
02) Structural Details S1 through S-4
03) Revised 025 Unit Pricing Form
04) Revised Wage Rate Determination
05) Landscape Specifications
06) Addendum Acknowledge Form

END OF ADDENDUM No. 3



E1.01 ELECTRICAL - POWER PLAN

SCALE: 1/4" = 1'-0"



E1.02 ELECTRICAL - LIGHTING PLAN

SCALE: 1/4" = 1'-0"

ELECTRICAL POWER SYMBOLS	
C	**RECEPTACLES FOR COMPUTER**
AC	**RECEPTACLES ABOVE COUNTER**
BC	RECEPTACLES BELOW COUNTER
CO	CONVENIENCE OUTLET
SC	SPLIT CIRCUIT
WP/GFCI	WEATHERPROOFED/GROUND FAULT CIRCUIT INTERRUPTER
POC	POINT OF CONNECTION
	TYPICAL CIRCUIT LEG
	TYPICAL SWITCH LEG
	HOMERUN, 120V CIRCUIT W/ GND.
	ISOLATED GND CIRCUIT W/ GND.
	HOMERUN, 208/1P CIRCUIT W/ GND.
	HOMERUN, 208/3P CIRCUIT W/ GND.
	QUADRAPLEX RECEPTACLE
CLG.	CEILING RECEPTACLE (FLUSH)
	FLOOR RECEPTACLE (FLUSH)
J	JUNCTION BOX
	DEDICATED ELECTRICAL DUPLEX OUTLET WITH ISOLATED GROUND 18" AFF
	208V, 1P RECEPTACLE
JE	JB FOR NORMAL POWER
JC	JB FOR COMPUTER POWER
JP	JB FOR PHONE CABLE
JD	SYMBOL FOR DATA CABLE
C	COMPUTER RECEPT. (DUPLEX)
	TELEPHONE (T), DATA OUTLET (D) FAX (F), MONITOR (M), S-VIDEO (S) (TERMINATE 3/4" CONDUIT 12" ABOVE CEILING WITH ELBOW.)
	SAFETY SWITCH AS SPEC.
WALL	RECESSED MOUNT PANEL BD.

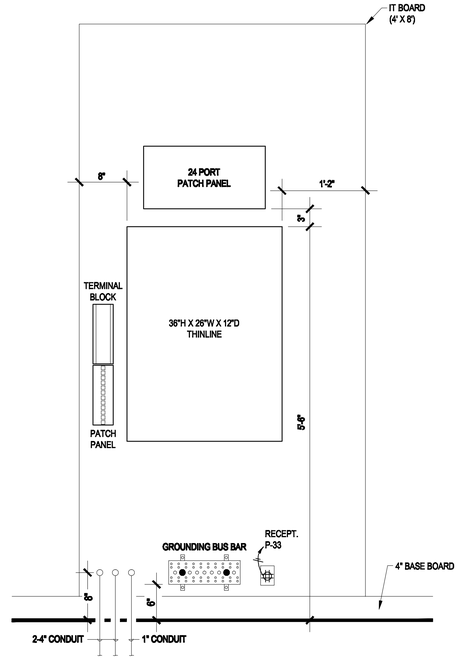
PANEL P 120/208, 3ϕ, 4W — SURFACE MOUNTED — 225 AMP MLO

ITEM	POLES AND AMPS	LOAD SERVING - WATTS A LTG	A POW	B LTG	B POW	C LTG	C POW	CIRC. NO.	A	B	C	CIRC. NO.	LOAD SERVING - WATTS A LTG	A POW	B LTG	B POW	C LTG	C POW	POLES AND AMPS	ITEM
CU-1	25		1800					1				2		3360					30	AHU-1
					1800			3				4				3360				
	3						1800	5				6						3360	3	
DCU-1/DFC-1	20		1477					7				8		1500					20 / 1	COUNTER APPLIANCE
	2				1477			9				10				1500			20 / 1	COUNTER APPLIANCE
EWH-1	20 / 1						2000	11				12						360	20 / 1	CO - BRK. RM. COUNTER
CO - BREAK ROOM	20 / 1		540					13				14		960					20 / 1	REFG.
CO - OFFICE	20 / 1				900			15				16				600			20 / 1	CO/GCFI - RESTROOM
CO - EXTERIOR	20 / 1						360	17				18					810	100	20 / 1	LTG - BLDG./EF-1&2
① BLDG. WALL PACKS	20 / 1	700						19				20		540					20 / 1	CO/GCFI/WP - LTG. POLE
① PARKING LIGHTS	20 / 1			875				21				22				200			20 / 1	TIMECLOCK/LTG. CONT.
① PARKING LIGHTS	20 / 1					1050		23				24						480	20 / 1	SLIDING GATE
① PARKING LIGHTS	20 / 1	1225						25				26		240					20 / 1	IRRIGATION PANEL
CO - IT ROOM	20 / 1			540				27				28			700				20 / 1	FRONT MOUNUMENT & LANDSCAPE ①
QUAD. CO - IT ROOM	20 / 1						720	29				30						2300	25 / 1	HAND DRYER
QUAD. CO - IT ROOM	20 / 1		720					31				32		960					20 / 1	EDF
QUAD. CO - IT ROOM	20 / 1				720			33				34								
								35				36								
								37				38								
								39				40								
								41				42								
TOTAL LIGHTING (VA)						5360		42 SPACES				SPARE CIRCUITS: (W)						4000		
TOTAL POWER (VA)						29274						DESIGN LOAD KVA						38.6		
CONNECTED LOAD (VA)				DEMAND		34634						DESIGN AMPS						108		AIC: 10 K

① ON TIMECLOCK & PHOTOCELL CONTROL.

MARK	MANUFACTURER	REMARKS	LAMPS	LAMPS/ FIXTURE	NOTE
L-1	STERNBERG LIGHTING - 1910/SRLM18/RPM/4200-RT416AG/150MHP/RESGSM/KHP150/MED/XX	POLE LIGHT, 16' ON CONCRETE BASE.	150 W. MH	1	
L-2	HUBBEL LIGHTING - LMC-150P8-X	WALL PACK	150 W. MH	1	
L-3	COLUMBIA PM24-232-FSA12125-3EU	2 x 4 SURFACE MOUNT	32WT8	2	①
L-4	COLUMBIA ST8-24-332-GFSA2125	2 X 4 LAY-IN, LOW PROFILE	32WT8	3	①
L-5	COLUMBIA PM24-332-FSA12125-EU	2 X 4 SURFACE MOUNT	32WT8	3	①
L-6	DUAL LITE - LXURWEI	EXIT SIGN	LED	LED	
L-7	KIM - AFL11-50PMHXXX-DB-HDS-AFL-LS	LANDSCAPE LIGHTING	50 W. MH	1	
L-8	KIM - AFL11-100PMHXXX-DB-HDS-AFL-LS	MONUMENT SIGN LTG.	100 W. MH	1	

NOTE:
1. FIXTURE DENOTED WITH AN "E" IS TO INCLUDE EMERGENCY BALLAST.

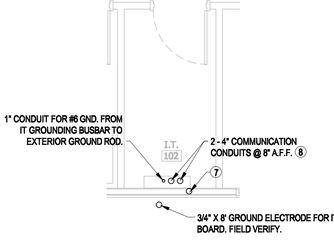


E1.03 IT COMMUNICATION BOARD

SCALE: NOT TO SCALE

ELECTRICAL NOTES

1. ALL WORK SHALL CONFORM TO THE NEC, IECC & THE CITY OF SA CODE.
2. SECURITY SYSTEM INSTALLATION SHALL BE BY OTHERS. COORDINATE WITH SECURITY CONTRACTOR.
3. COMPUTER SYSTEM NETWORKING SHALL BE BY OTHERS.
4. G.C SHALL COORDINATE WITH THE CITY OF S.A. SOLID WASTE MANAGEMENT DEPARTMENT CONCERNING ALL EQUIPMENT, POWER, DATA, CONDUITS, ETC LOCATIONS AND REQUIREMENTS.
5. PERSONS OF CONTACT @ CITY OF S.A. SOLID WASTE MANAGEMENT DEPT.: (210) 207-8475
   - ART ALVAREZ, DEPT.. SYSTEMS SPECIALIST CELL: (210) 215-6671
   - MIKE MITCHELL, IT TECH. COORDINATE FOR ALL IT REQUIREMENTS AND INSTALLATION.
6. G.C. SHALL COORDINATE WITH THE COSA SOLID WASTE MGMNT. DEPT. PRIOR TO START OF ANY WORK AND DURING CONSTRUCTION.
7. 2" PVC CONDUIT ROUGH-IN WALL @ 8" BELOW CLG. HT. ROUGH-IN 8" ABOVE CLG. WITH ELBOW. PROVIDE PULL STRING.
8. COORDINATE WITH CIVIL SITE PLAN. FIELD VERIFY.
9. VERIFY ALL RECEPTACLE AND DATA LOCATIONS.



E1.04 ELECTRICAL - DATA PLAN

SCALE: 1/4" = 1'-0"

KJ Engineering, Inc.
434 BREESPORT
SAN ANTONIO, TEXAS 78216
PHONE 210.490-1755
FAX 210.490.2248

STATE OF TEXAS
GLENN L. WILLIAMS
103699
REGISTERED
PROFESSIONAL ENGINEER

05-22-2012

FRIO CITY BULKY WASTE COLLECTION CENTER

CITY OF SAN ANTONIO SOLID WASTE MANAGEMENT DEPARTMENT

Frio City Road, San Antonio, Texas 78226

REVISIONS	DESCRIPTION	DATE

APPROVED

SHEET NAME

ELECTRICAL POWER/LIGHTING PLAN SCHEDULES & DETAILS

SHEET NUMBER

E-1

ELECTRICAL SPECIFICATIONS

1. WORK INCLUDED:
A. PROVIDE MATERIALS, EQUIPMENT, LABOR AND SERVICES NECESSARY FOR THE INSTALLATION AND PLACING INTO OPERATION OF A COMPLETE ELECTRICAL SYSTEM AS SPECIFIED OR INDICATED.

B. THE WORK IN GENERAL SHALL CONSIST OF, BUT IS NOT LIMITED TO THE FOLLOWING:
I). FURNISHING AND INSTALLING FIXTURES WITH LAMPS, UNLESS NOTED OTHERWISE.

II). FURNISHING AND INSTALLING ELECTRICAL WORK, PANELS, SERVICE CONDUIT, WIRING, ETC., FOR OUTLETS AND EQUIPMENT.

III). FURNISHING AND INSTALLING OUTLETS, CONDUITS AND WIRE AS INDICATED.

iv). TEMPORARY CONSTRUCTION POWER: FURNISH AND INSTALL TEMPORARY CONSTRUCTION POWER WIRING AS REQUIRED PROVIDING SUFFICIENT POWER AND LIGHTING FOR CONSTRUCTION NEEDS. OBTAIN TEMPORARY ELECTRICAL SERVICE IN THE NAME OF THE OWNER. PROVIDE TEMPORARY LIGHTING AS REQUIRED BY OCCUPATIONAL SAFETY AND HEALTH ACT FOR ADEQUATE ILLUMINATION FOR CONSTRUCTION AND SAFETY PURPOSES.

2. GENERAL REQUIREMENTS:
A. EQUIPMENT FURNISHED SHALL FIT THE SPACE AVAILABLE, WITH CONNECTION, ETC., IN THE REQUIRED LOCATIONS AND WITH ADEQUATE SPACE FOR OPERATING AND SERVICING. THE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND INDICATE THE MANNER AND METHOD OF THE INSTALLATION WHILE THE SPECIFICATIONS AND FIXTURE LIST DENOTE THE TYPE AND QUALITY OF MATERIALS AND WORKMANSHIP TO BE USED.

3. EQUIPMENT AND MATERIAL:
A. MATERIALS FURNISHED UNDER THIS CONTRACT SHALL BE NEW, FREE FROM DEFECTS OF ANY CHARACTER, AND SHALL CONFORM TO THE STANDARDS OF THE UNDERWRITERS LABORATORIES, INC., IN EVERY CASE WHERE SUCH A STANDARD HAS BEEN ESTABLISHED, AND SHALL BE SO LABELED.

B. WHERE TWO OR MORE SIMILAR TYPE ITEMS ARE FURNISHED, ALL SHALL BE OF THE SAME MANUFACTURER, E.G., DISCONNECT SWITCHES SHALL BE OF THE SAME MANUFACTURER UNLESS OTHERWISE NOTED.

C. MATERIAL AND INSTALLATION METHODS USED SHALL BE IN ACCORD WITH THE LATEST AND APPROVED ELECTRICAL AND MECHANICAL ENGINEERING PRACTICES.

4. SERVICE ENTRANCE EQUIPMENT:
A. SERVICE ENTRANCE EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE MUNICIPAL GOVERNING BODY AND SHOP DRAWINGS SHALL BE SUBMITTED TO THE SERVING UTILITY FOR APPROVAL BY SAME.

5. PANELBOARDS:
A. EACH PANEL SHALL BE PROVIDED WITH DOOR LOCK AND TWO KEYS, KEYED ALIKE. EACH PANEL SHALL BE PROVIDED WITH TYPEWRITTEN SHEET INSTALLED ON DOOR, IDENTIFYING THE USE OF THE BRANCH CIRCUIT. PANELS SHALL BE FLUSH MOUNTED EXCEPT AS OTHERWISE INDICATED. PANELS SHALL HAVE BUSSING AS INDICATED ON THE DRAWINGS AS MANUFACTURED BY SQUARE D, ITE, GE, CUTLER HAMMER OR APPROVED EQUAL.

6 CONDUITS:
A EMT: ANSI C80.3, ZINC-COATED STEEL, LIQUID-TIGHT WITH COMPRESSION FITTINGS.
B IMC: ANSI C80.6, ZINC-COATED STEEL, WITH THREADED FITTINGS.
C RMC (RGS): ANSI C80.1.
D RNC (RPVC): NEMA TC 2, SCHEDULE 40 PVC, NEMA TC 3 FITTINGS.

7 WIRING
A CONDUCTORS, #10 AWG AND SMALLER SHALL BE SOLID COPPER.
B CONDUCTORS, #10 AWG AND LARGER SHALL BE STRANDED COPPER.
C THERMOPLASTIC INSULATION RATED AT 75 DEG. C MINIMUM.
D WIRE CONNECTORS AND SPLICES RATED FOR SIZE, CAPACITY, MATERIAL, TYPE AND CLASS SUITABLE FOR REQUIRED SERVICE.
E NO ALUMINUM CONDUCTORS ALLOWED.
F MINIMUM CONDUCTOR SHALL BE #12 AWG.
G FEEDERS: TYPE THHN/THWN INSULATED CONDUCTORS IN RACEWAY.
H UNDERGROUND FEEDERS AND BRANCH CIRCUITS: TYPE THWN.
I BRANCH CIRCUITS: TYPE THHN/THWN INSULATED CONDUCTORS IN RACEWAY.
J REMOTE CONTROL SIGNALING AND POWER LIMITED CIRCUITS: TYPE THHN/THWN INSULATED CONDUCTORS IN RACEWAY FOR CLASS 1, 2 AND 3 UNLESS REQUIRED OTHERWISE.

8. ELECTRIC WIRING:
A. MECHANICAL EQUIPMENT HAVING ELECTRIC MOTORS SHALL BE FURNISHED WITH NECESSARY CONTROL DEVICES FOR THE PROTECTION OF EACH MOTOR AND FOR AUTOMATIC AND/OR MANUAL CONTROL.

B. ELECTRIC WIRING IS INCLUDED UNDER THE ELECTRICAL SECTION OF THE SPECIFICATIONS EXCEPT LOW VOLTAGE CONTROL WIRING. THE CONTRACTOR SHALL FURNISH TEMPERATURE CONTROL, MAGNETIC STARTER, AND OTHER CONTROL SWITCHES AND DEVICES TO THE ELECTRICAL INSTALLER. CONTROLS, RELAYS, STARTERS AND WIRING SHALL CONFORM TO THE GOVERNING ELECTRICAL CODES.

9 ELECTRICAL IDENTIFICATION
A ID FOR CONDUCTORS AND CONTROL CABLES.
B UNDERGROUND WARNING TAPE.
C WARNING LABELS AND SIGNS.
D EQUIPMENT ID LABELS.

10 SUPPORT DEVICES
A COLD-FORMED STEEL, WITH CORROSION-RESISTANT COATING ACCEPTABLE TO AHJ.
B HOT-DIPPED GALVANIZED STEEL FOR OUTDOOR USE OR DAMP LOCATIONS.
C SLOTTED STEEL CHANNEL SUPPORTS: FLANGE EDGES TOWARD WEB WITH 9/16" DIA. HOLES AT 2" O.C., MAX.
D CHANNELS SELECTED FOR STRUCTURAL LOADING.
E FITTINGS AND ACCESSORIES SHALL BE SAME MANUFACTURER AS CHANNEL SUPPORTS.
F RACEWAY AND CABLE SUPPORTS: MANUFACTURED RISER CLAMPS, STRAPS.
G FURNISHED CABLE SUPPORTS FOR VERTICAL CONDUITS.

11. MISCELLANEOUS MATERIALS: IF APPLICABLE
A. SAFETY SWITCHES: HEAVY DUTY AND GENERAL DUTY AS REQUIRED AND/OR AS NOTED ON DRAWINGS. USE NEMA-1 FOR INTERIOR USE AND NEMA-3R FOR EXTERIOR USE.

B. FUSES: BUSSMAN MFG.

C. CONDUIT STRAPS: HEAVY GAUGE STEEL SNAP-ON TYPE.

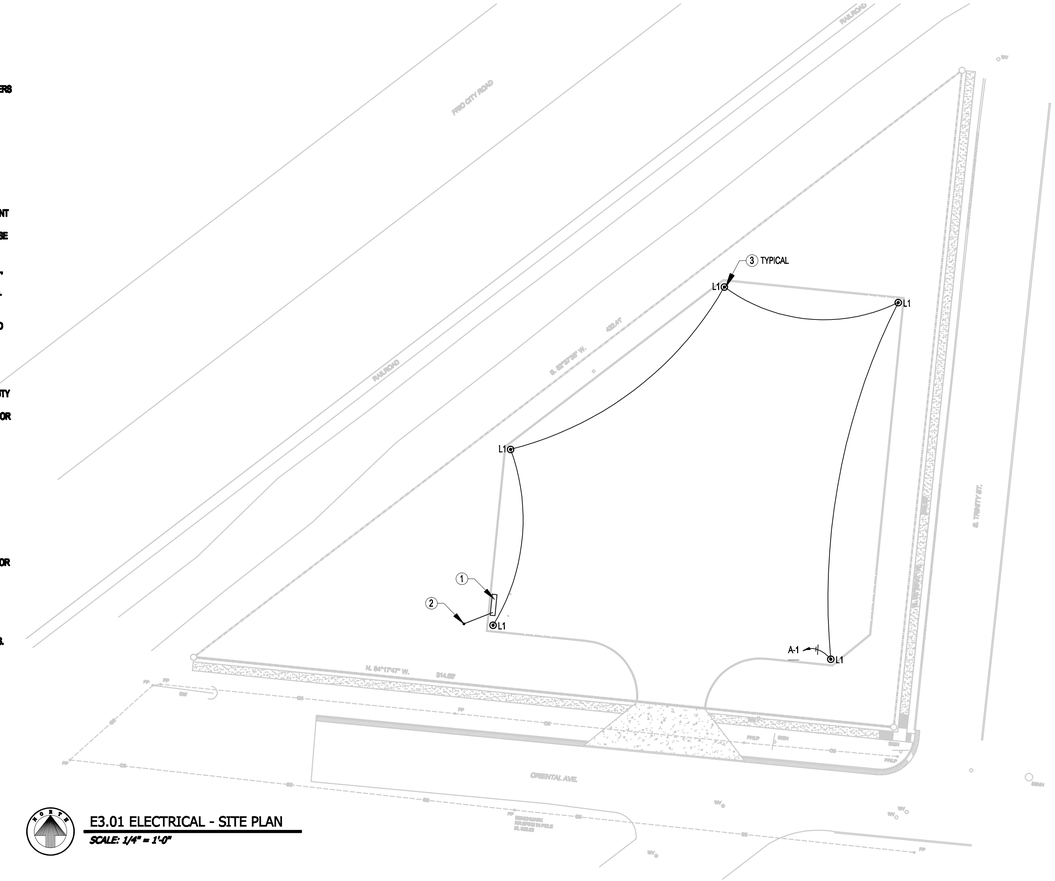
D. OUTLET BOXES, PLASTER RINGS, ETC.: EQUAL TO RACO.

E. CONDUITS: EQUAL TO CROUSE-HINDS.

F. WIRE AND CABLE: EQUAL TO GENERAL CABLE AND/OR SIMPLEX.

G. DEVICES: EQUAL TO HUBBELL, SWITCHES 1220 RECEPTACLES (5262-1).

H. DEVICE PLATES: "SLATER", "STA-KLEEN", AND "MEDALIST FLIP-LID" FOR WEATHERPROOF LOCATIONS.



E3.01 ELECTRICAL - SITE PLAN
SCALE: 1/4" = 1'-0"

ELECTRICAL POWER SYMBOLS	
C	**RECEPTACLES FOR COMPUTER**
AC	**RECEPTACLES ABOVE COUNTER**
BC	RECEPTACLES BELOW COUNTER
CO	CONVENIENCE OUTLET
SC	SPLIT CIRCUIT
WP/GFCI	WEATHERPROOFED/GROUND FAULT CIRCUIT INTERRUPTER
POC	POINT OF CONNECTION
	TYPICAL CIRCUIT LEG
	TYPICAL SWITCH LEG
	HOMERUN, 120V CIRCUIT W/ GND.
	ISOLATED GND CIRCUIT W/ GND.
	HOMERUN, 208/1P CIRCUIT W/ GND.
	HOMERUN, 208/3P CIRCUIT W/ GND.
	QUADRAPLEX RECEPTACLE
CLG.	CEILING RECEPTACLE (FLUSH)
	FLOOR RECEPTACLE (FLUSH)
J	JUNCTION BOX
	DEDICATED ELECTRICAL DUPLEX OUTLET WITH ISOLATED GROUND 18" AFF
	208V, 1P RECEPTACLE
J E	JB FOR NORMAL POWER
J C	JB FOR COMPUTER POWER
J P	JB FOR PHONE CABLE
J D	SYMBOL FOR DATA CABLE
C	COMPUTER RECEPT. (DUPLEX)
	TELEPHONE (T), DATA OUTLET (D) **FAX (F), MONITOR (M), S-VIDEO (S)** (TERMINATE 3/4" CONDUIT 12" ABOVE CEILING WITH ELBOW.)
	SAFETY SWITCH AS SPEC.
WALL	RECESSED MOUNT PANEL BD.

ELECTRICAL GENERAL NOTES

1. ALL WORK AND INSTALLATION SHALL CONFORM TO THE 2011 NEC, 2012 IECC AND CITY OF SAN ANTONIO CODES.

ELECTRICAL KEY NOTES

(1) ELECTRICAL SERVICE RISER ON KINDORF FRAME. REF. DETAIL E1.04.

(2) NEW TRANSFORMER POLE. 120/240/1P/3W SERVICE.

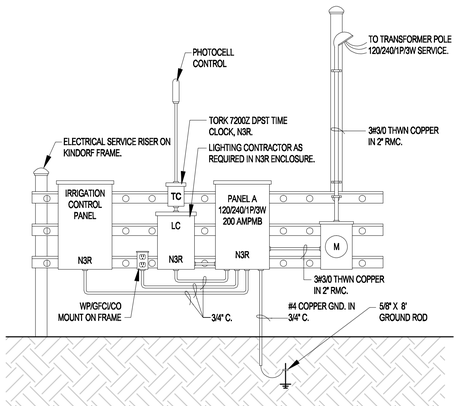
(3) REF. CIVIL PLANS FOR LIGHTING POLE BASE DETAIL AND GROUND TYPICAL FOR FIXTURE L1.

(4) MIN. UNDERGROUNG CONDUIT SIZE AT 3/4". INSTALL AT MIN. 30" BELOW FINISHED GRADE.

MARK	MANUFACTURER	REMARKS	LAMPS	LAMPS/ FIXTURE
L1	SPAULDING RCS-A4-P32-H4-F-Q-DB-L POLE: SSS-25-40-1-A2-DB	AREA LIGHT, 25' POLE.	320 W. MH	1

ELECTRICAL LOAD ANALYSIS	
DESCRIPTION	**VA**
LIGHTING (125%)	3690
CONV. OUTLET	180
MISC.	440
FUTURE	30000
TOTAL CONNECTED	34310 ~ 143 AMPS @ 240V/1P

E3.02 ELECT. LOAD ANALYSIS
SCALE: NOT TO SCALE



E3.04 ELECTRICAL RISER DIAGRAM
SCALE: NOT TO SCALE

ALL FEEDERS SHALL BE COPPER

PANEL A 120/240, 1ϕ,3W — SURFACE MOUNTED — **225 AMP 200 A MAIN**

	ITEM	POLES AND AMPS	LOAD (W)	WIRE		CIRC. NO.	A	B	CIRC. NO.	LOAD (W)	WIRE		POLES AND AMPS	ITEM
(1)	SITE LIGHTING	20/1	1750	#10		1			2	240	#12		20/1	IRRIGATION PANEL
(1)	LANDSCAPE LIGHTING	20/1	1200	#12		3			4	180	#12		20/1	WP/GFCI CONV. OUTLET
	SPARE	20/1				5			6	200	#12		20/1	TIMECLOCK/ LTG CONTRACTOR
	SPARE	20/1				7			8				20/1	SPARE
	SPARE	20/1				9			10				20/1	SPARE
	SPARE	20/1				11			12				20/1	SPARE
	SPACE					13			14					SPACE
	SPACE					15			16					SPACE
	SPACE					17			18					SPACE
	SPACE					19			20					SPACE
	SPACE					21			22					SPACE
	SPACE					23			24					SPACE
	SPACE					25			26					SPACE
	SPACE					27			28					SPACE
	SPACE					29			30					SPACE
	SPACE					31			32					SPACE
	SPACE					33			34					SPACE
	SPACE					35			36					SPACE
	SPACE					37			38					SPACE
	SPACE					39			40					SPACE
	SPACE					41			42					SPACE
	TOTAL LIGHTING (VA)					2950	42 SPACES			SPARE CIRCUITS (W)		30000		
	TOTAL POWER (VA)					660				DESIGN LOAD (kW)		33.6		
	CONNECTED LOAD (VA)			DEMAND		3610				DESIGN AMPS		140		AIC: 10K

(1) - ON TIME CLOCK & PHOTOCELL VIA LTG CONTRACTOR

KJ Engineering, Inc.
434 BREESPORT
SAN ANTONIO, TEXAS 78216
PHONE 210.490-1755
FAX 210.490.2248

STATE OF TEXAS
GLENN L. WILLIAMS
33692
REGISTERED
PROFESSIONAL ENGINEER

04-30-2012

Oriental Avenue Lot
611 Oriental Avenue
San Antonio, Tx

REVISIONS	DESCRIPTION	DATE	APPROVED

SHEET NAME
ELECTRICAL
SITE LIGHTING PLAN
SCHEDULES & DETAILS

SHEET NUMBER
E-3

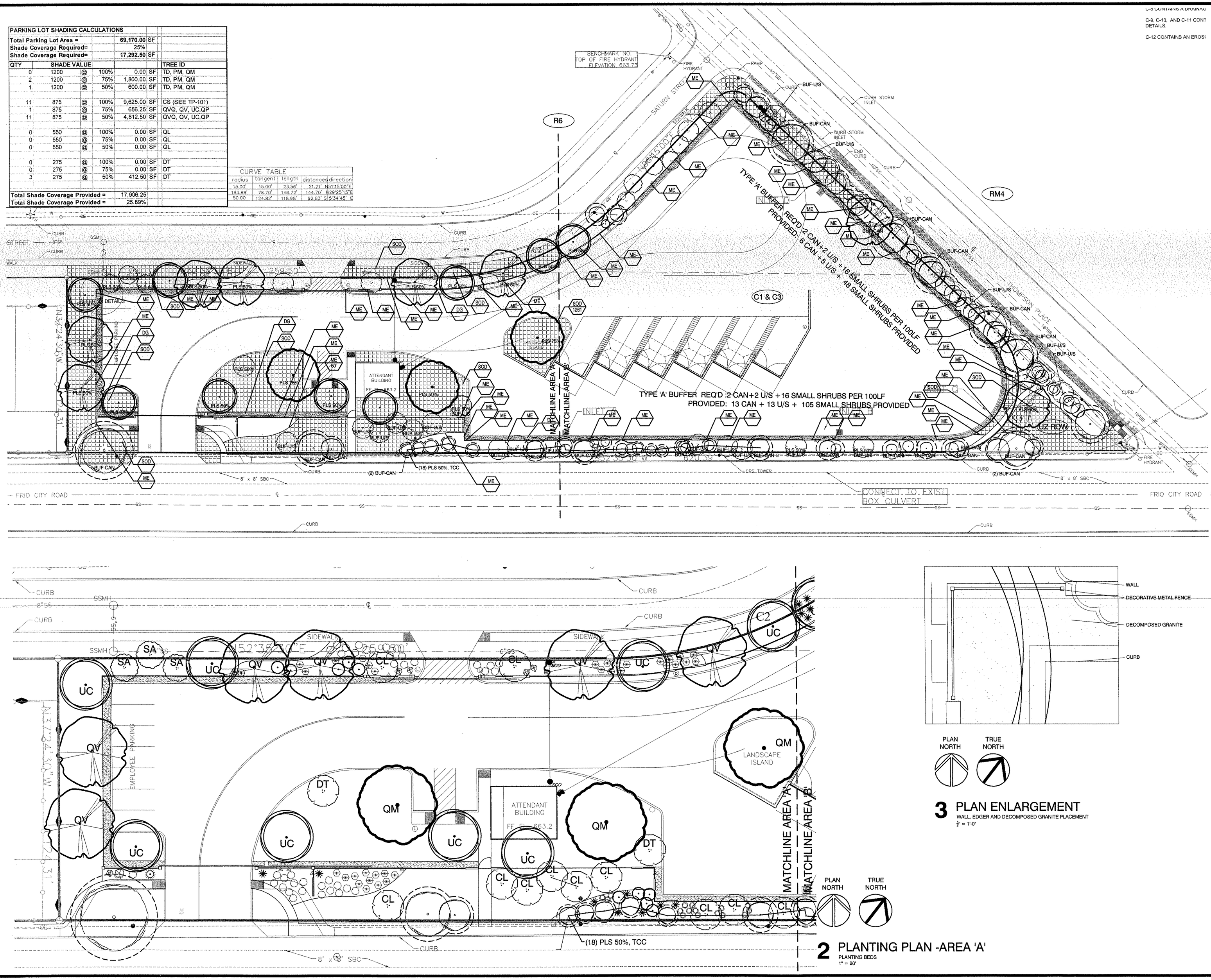
PARKING LOT SHADING CALCULATIONS					
Total Parking Lot Area =			69,170.00	SF	
Shade Coverage Required=			25%		
Shade Coverage Required=			17,292.50	SF	
QTY	SHADE VALUE				TREE ID
0	1200	@	100%	0.00 SF	TD, PM, QM
2	1200	@	75%	1,800.00 SF	TD, PM, QM
1	1200	@	50%	600.00 SF	TD, PM, QM
11	875	@	100%	9,625.00 SF	CS (SEE TP-101)
1	875	@	75%	656.25 SF	QVQ, QV, UC,QP
11	875	@	50%	4,812.50 SF	QVQ, QV, UC,QP
0	550	@	100%	0.00 SF	QL
0	550	@	75%	0.00 SF	QL
0	550	@	50%	0.00 SF	QL
0	275	@	100%	0.00 SF	DT
0	275	@	75%	0.00 SF	DT
3	275	@	50%	412.50 SF	DT
Total Shade Coverage Provided =				17,906.25	
Total Shade Coverage Provided =				25.89%	

CURVE TABLE				
radius	tangent	length	distance	direction
15.00'	15.00'	23.56'	21.21'	N51°15'00"E
183.88'	78.70'	148.72'	144.70'	N29°25'15"E
50.00	124.82'	118.98'	92.83'	S15°34'45" E

C-8 CONTAINS A DRAINAG

C-9, C-10, AND C-11 CONT DETAILS.

C-12 CONTAINS AN EROSI



1 TREE & TURF PLAN
OVERALL SITE
1" = 30'

2 PLANTING PLAN -AREA 'A'
PLANTING BEDS
1" = 20'

3 PLAN ENLARGEMENT
WALL, EDGER AND DECOMPOSED GRANITE PLACEMENT
3/4" = 1'-0"

project no. 12079

REGISTERED LANDSCAPE ARCHITECT KIMBERLEY R. WOLF 7005 STATE OF TEXAS

date 06/01/2012

Frio Bulky Waste Collection Center

City of San Antonio Solid Waste Management Department
Frio City Road, San Antonio, TX 78226

revisions:

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architecture interior design landscape architecture
745 e mulberry ave suite 601
san antonio texas 78212
telephone: 210.733.3535
web: www.rvk-architects.com

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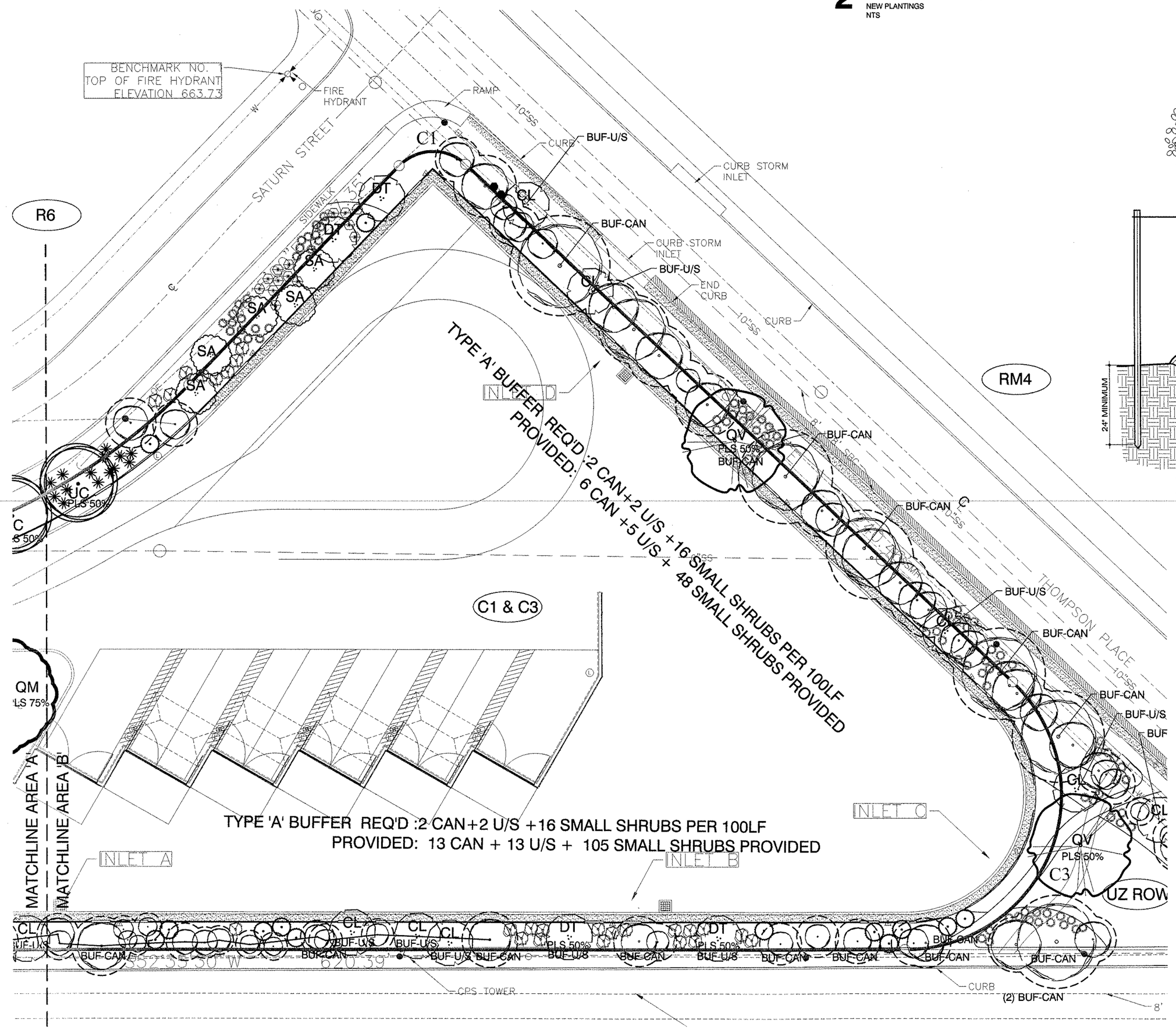
L-100
PLANTING PLAN

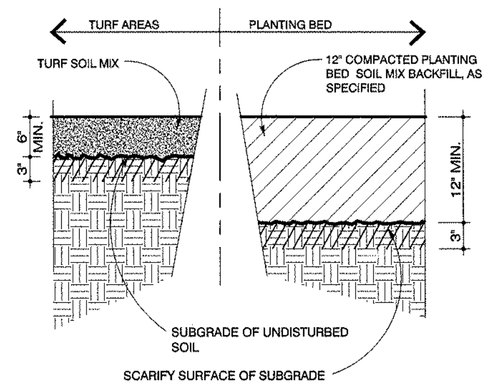
PLAN NORTH

TRUE NORTH

1 PLANTING PLAN - AREA 'B'

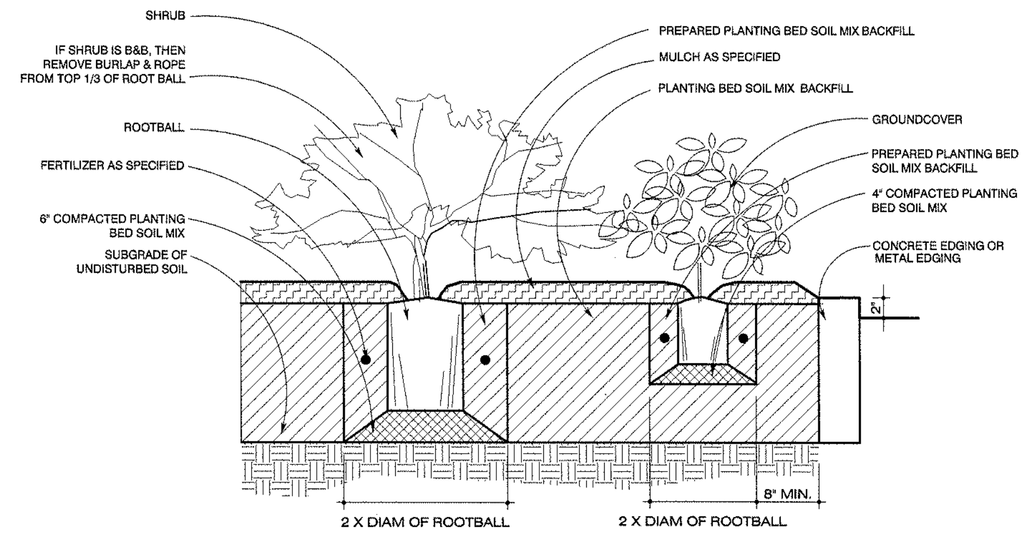
PLANTING BEDS
1" = 20'





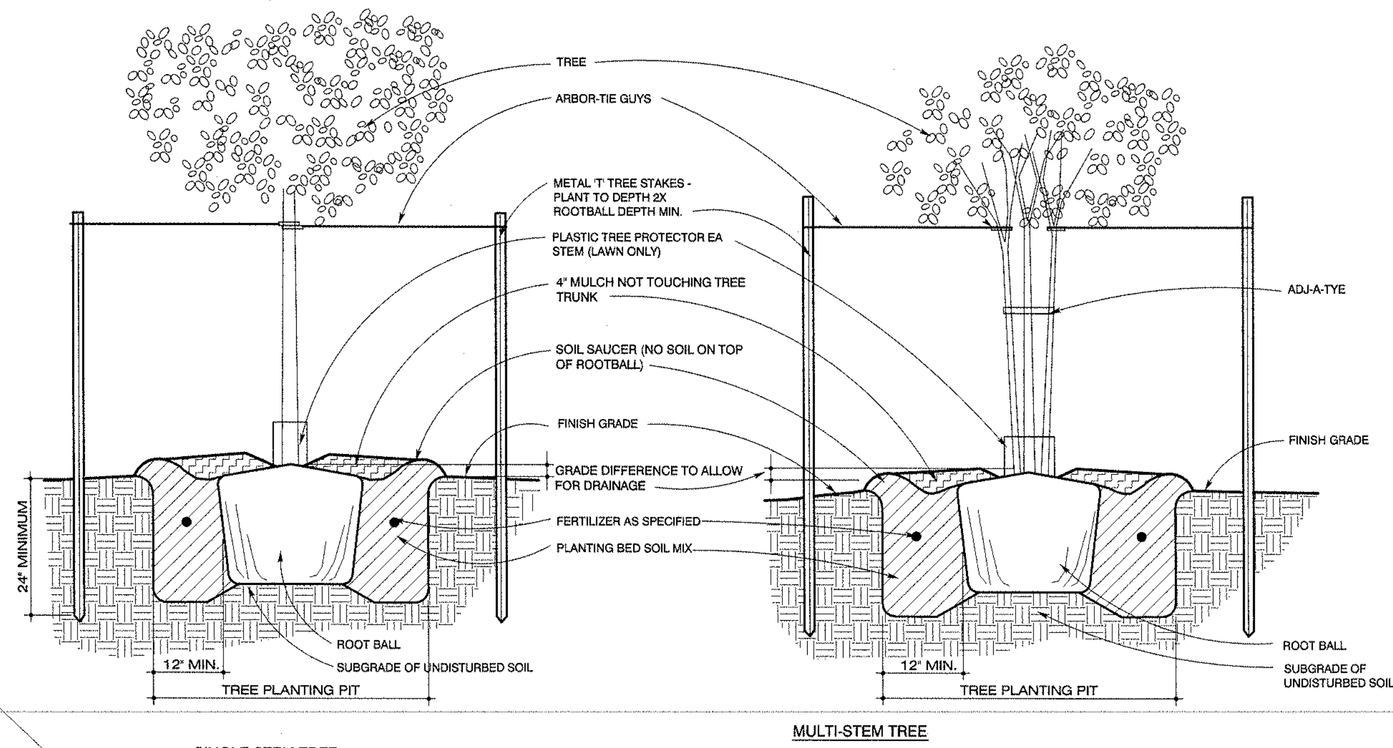
2 SOIL PREPARATION

NEW PLANTINGS
NTS



3 SHRUB AND GROUNDCOVER PLANTING

NEW PLANTINGS IN CONTINUOUS PLANTING BEDS
NTS



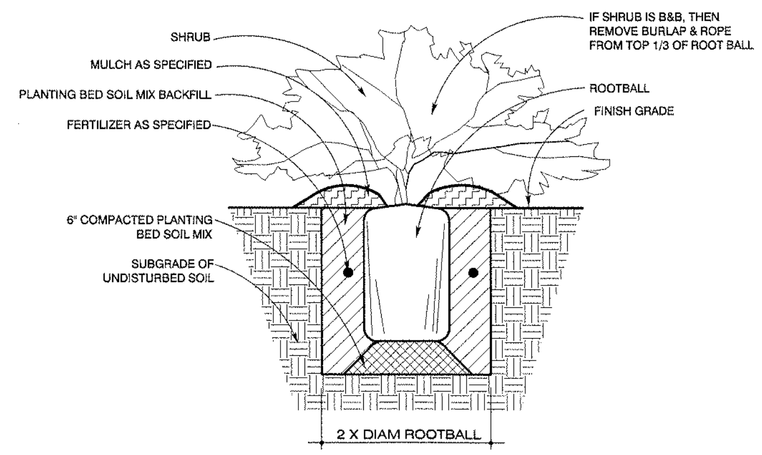
MULTI-STEM TREE

SINGLE STEM TREE

NOTE:
1. PLACE STAKES IN THE DIRECTION OF PREDOMINATE WINDS OF THE AREA.
2. TREE PLANTING PIT TO BE AT LEAST TWICE THE DIAMETER OF THE ROOT BALL
3. REMOVE BURLAP WRAP & ROPES/ CABLES FROM ROOT BALL
4. BREAK UP SIDES AND BOTTOM OF TREE HOLE SO ROOTS CAN PENETRATE BASE MATERIAL

4 TREE PLANTING

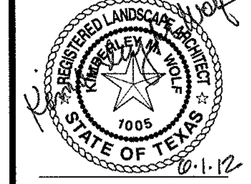
NEW PLANTINGS
NTS



5 SHRUB PLANTING

NEW PLANTING - INDIVIDUAL PLANTING PIT
NTS

project no. 12079



date 06/01/2012

Frio Bulky Waste Collection Center

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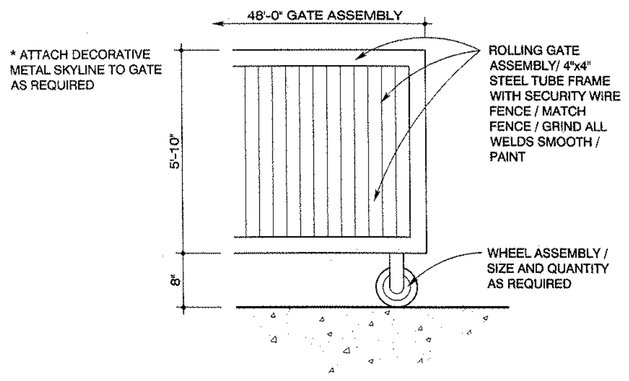
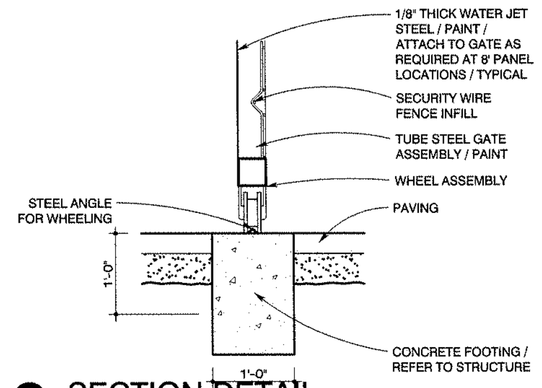
L-101

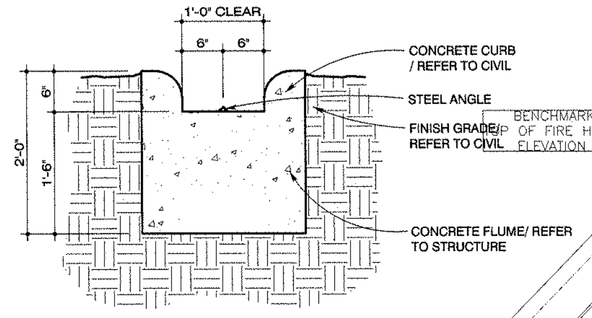
PLANTING PLAN



1 DETAIL
GATE ASSEMBLY
3/4" : 1'

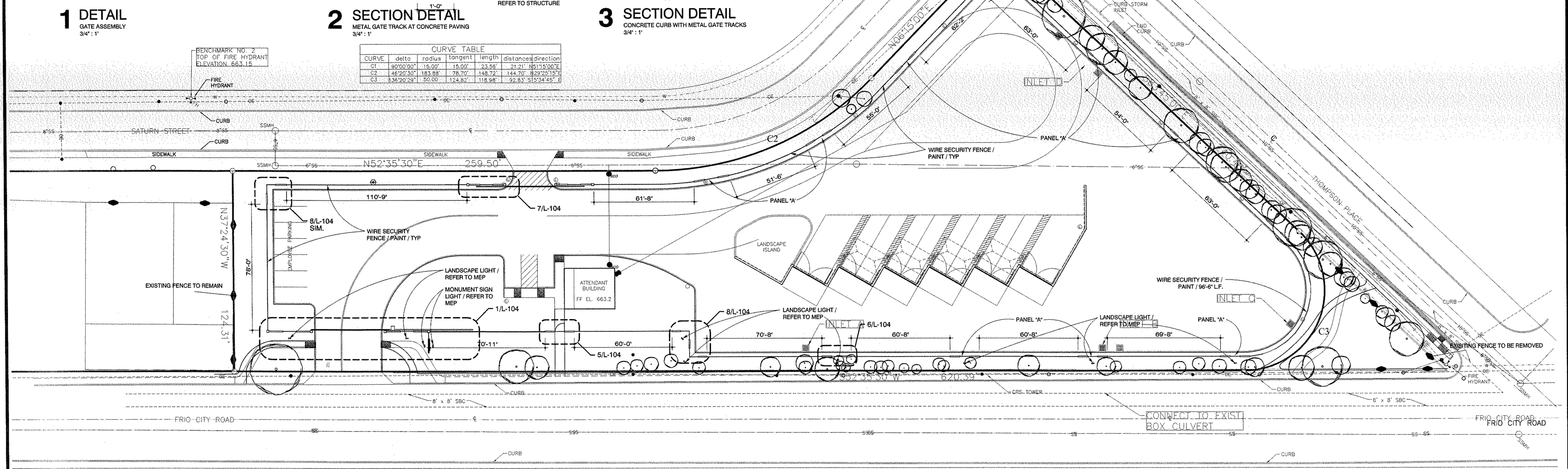


2 SECTION DETAIL
METAL GATE TRACK AT CONCRETE PAVING
3/4" : 1'

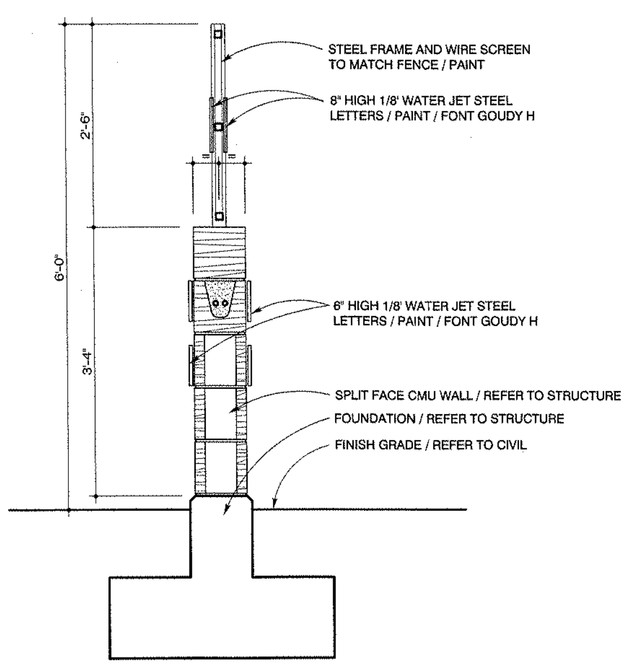


3 SECTION DETAIL
CONCRETE CURB WITH METAL GATE TRACKS
3/4" : 1'

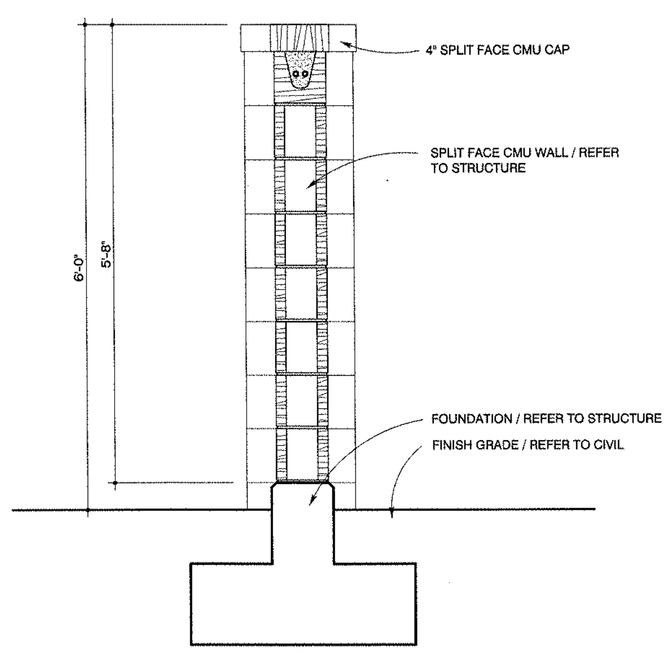
CURVE TABLE						
CURVE	delta	radius	tangent	length	distances	direction
C1	90°00'00"	15.00'	15.00'	23.56'	21.21'	N51°15'00"E
C2	46°20'30"	183.88'	78.70'	148.72'	144.70'	N29°35'15"E
C3	136°20'29"	50.00'	124.82'	118.98'	92.83'	S15°34'45" E



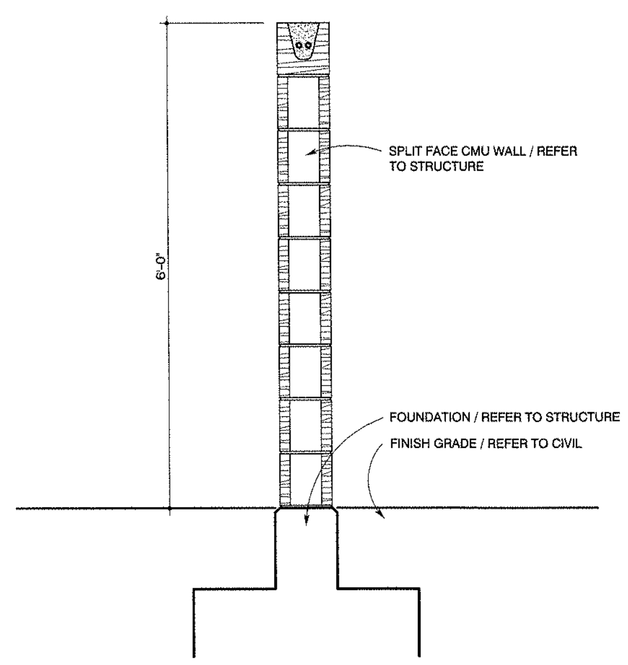
4 FENCE & HARDSCAPE PLAN
OVERALL SITE
1" = 30'



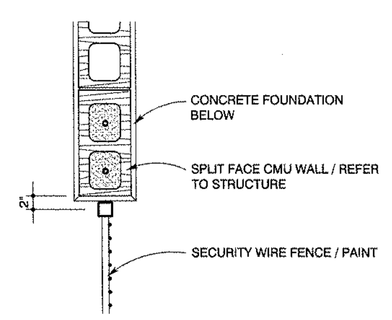
5 SECTION DETAIL
MONUMENT SIGN
3/4" : 1'



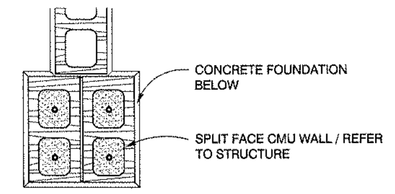
6 SECTION DETAIL
CMU WALL AT MAIN ENTRY
3/4" : 1'



7 SECTION DETAIL
CMU WALL - TYPICAL
3/4" : 1'



8 PLAN DETAIL
CMU TO METAL FENCE
3/4" : 1'



9 SECTION DETAIL
CMU COLUMN
3/4" : 1'

project no. 12079

C-4 CONTAINS A FIRE PLAN.
C-5 CONTAINS A UTILITY PLAN.
C-6 CONTAINS UTILITY DETAILS.
C-7 CONTAINS A GRADING PLAN.
C-8 CONTAINS A DRAINAGE PLAN.
C-9, C-10, AND C-11 CONTAIN SEC DETAILS.
C-12 CONTAINS AN EROSION CON

REGISTERED LANDSCAPE ARCHITECT KENNETH W. WOLF 1005 STATE OF TEXAS 10.1.12

date 06/01/2012

Frio Bulky Waste Collection Center
City of San Antonio Solid Waste Management Department
Frio City Road, San Antonio, TX 78226

revisions:

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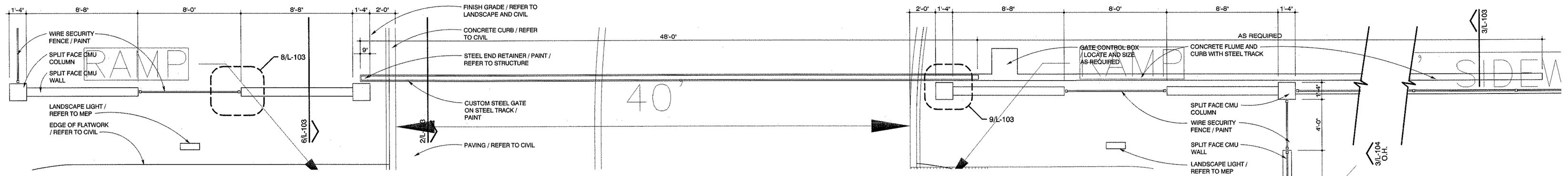
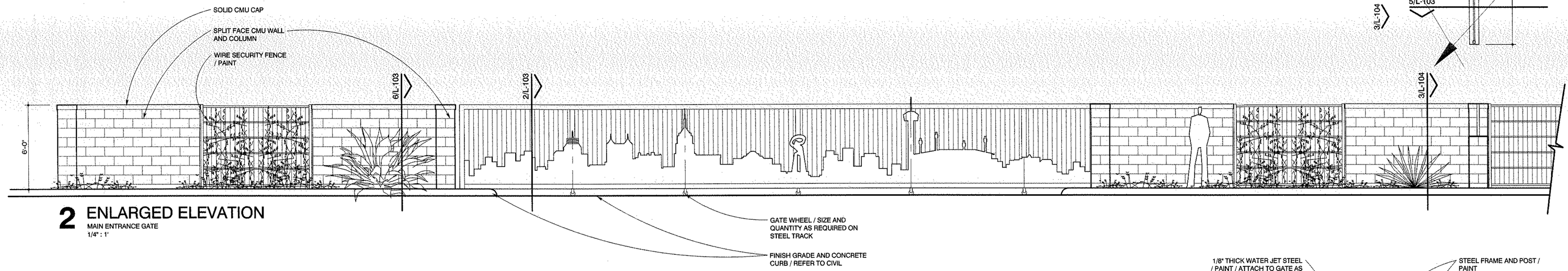
L-102

FENCE & HARDSCAPE PLAN

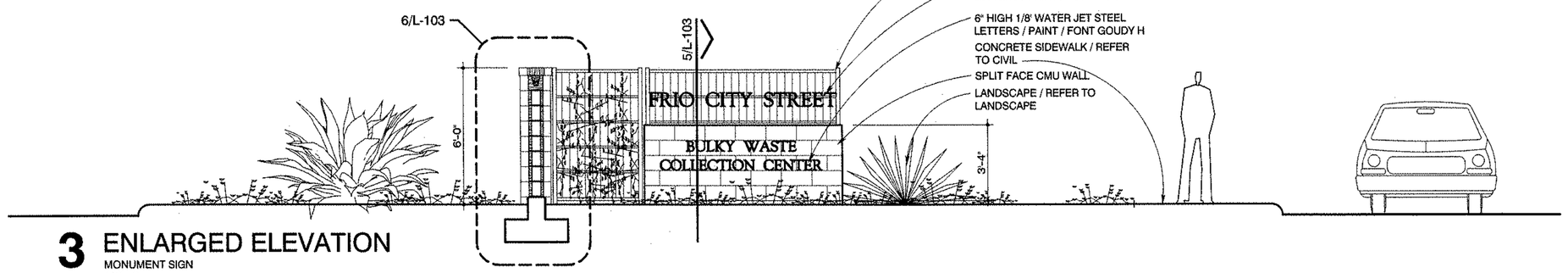


1 ENLARGED PLAN
MAIN ENTRANCE GATE
1/4" : 1'

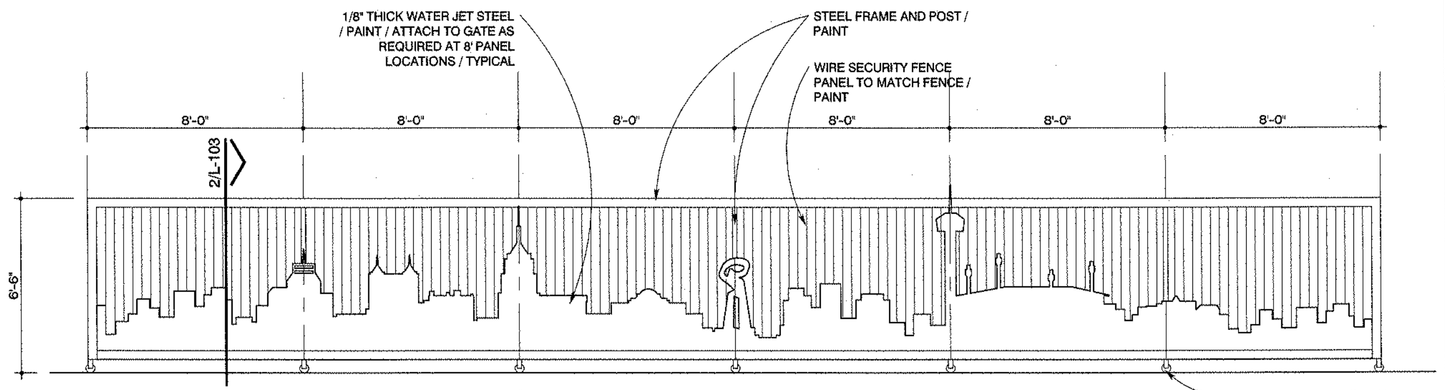
2/L-104



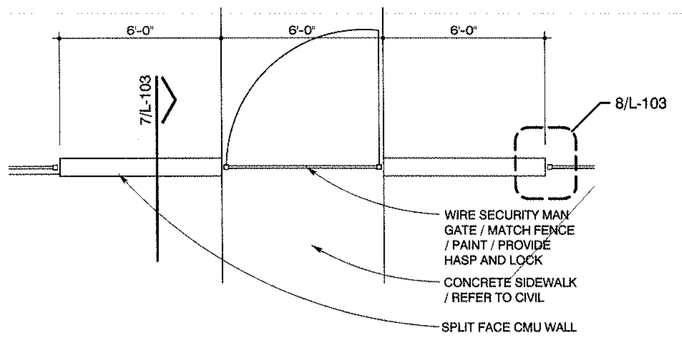
2 ENLARGED ELEVATION
MAIN ENTRANCE GATE
1/4" : 1'



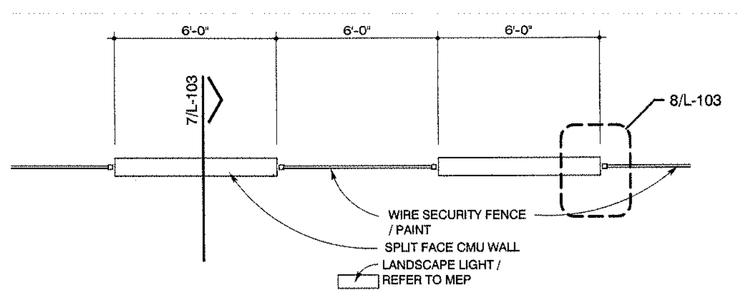
3 ENLARGED ELEVATION
MONUMENT SIGN
1/4" : 1'



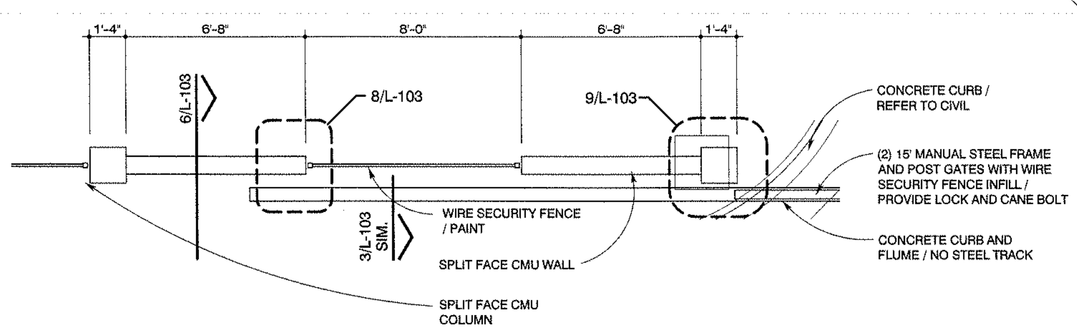
4 ENLARGED ELEVATION
AUTOMATIC MAIN GATE
1/4" : 1'



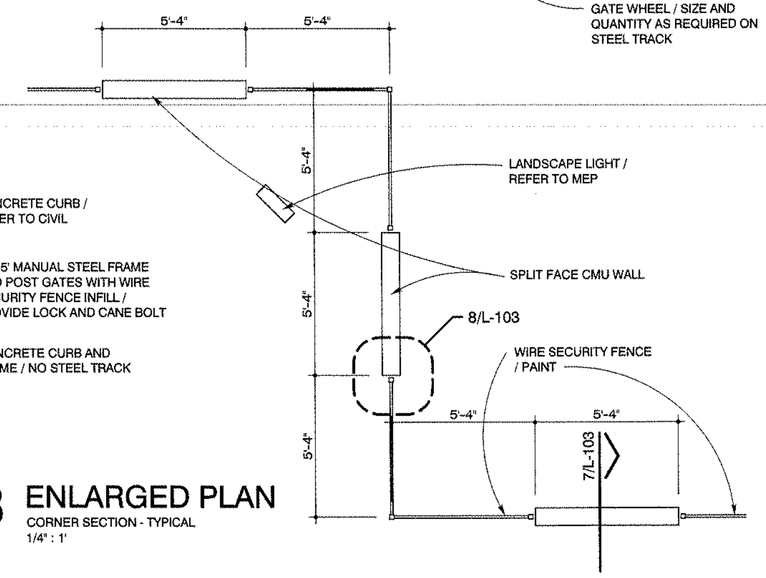
5 ENLARGED PLAN
MAN GATE
1/4" : 1'



6 ENLARGED PLAN
STRAIGHT SECTION - TYPICAL "PANEL A"
1/4" : 1'

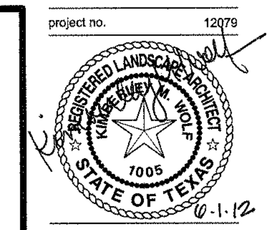


7 ENLARGED PLAN
MANUAL SECONDARY GATE
1/4" : 1'



8 ENLARGED PLAN
CORNER SECTION - TYPICAL
1/4" : 1'

project no. 12079



6-1-12

date 06/01/2012

Frio Bulky Waste Collection Center
City of San Antonio Solid Waste Management Department
Frio City Road, San Antonio, TX

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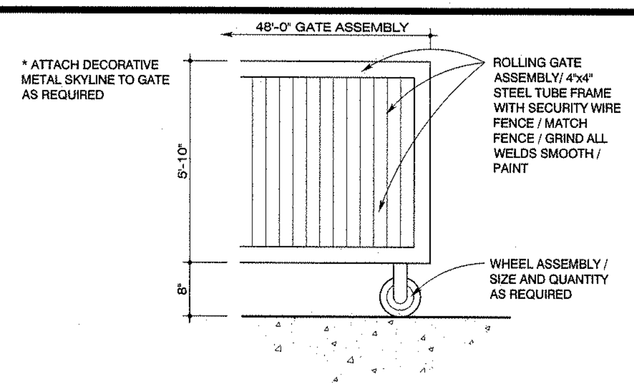
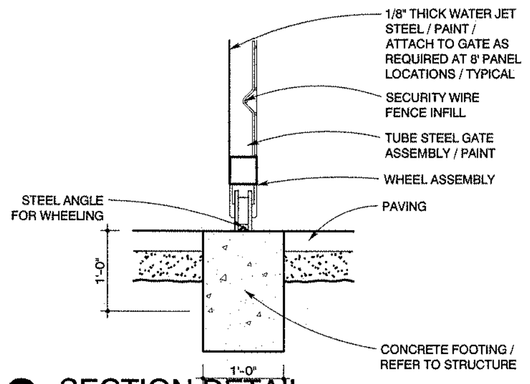
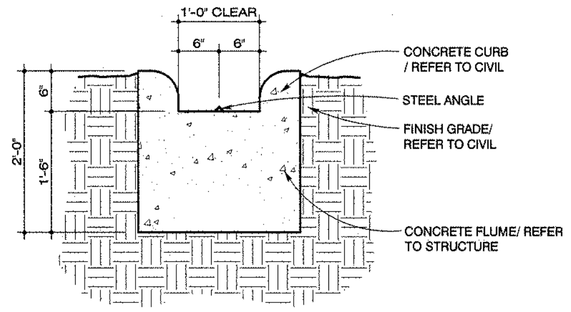
L-103
FENCE DETAILS



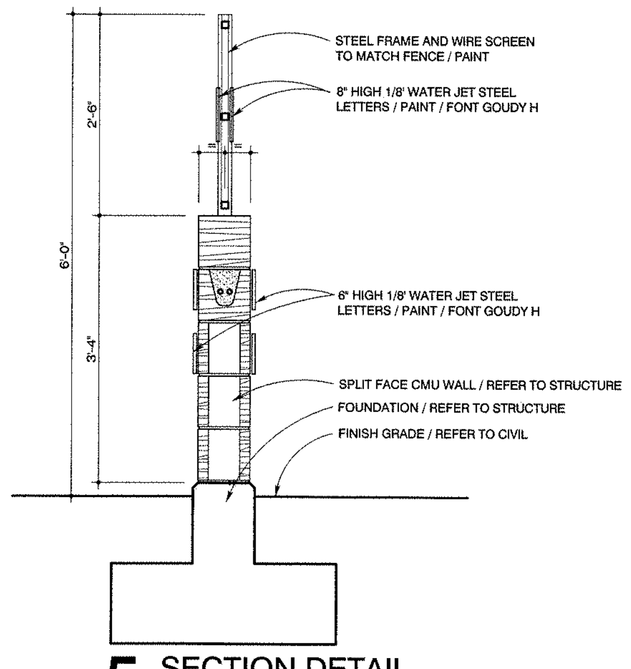
1 DETAIL
GATE ASSEMBLY
3/4" : 1'



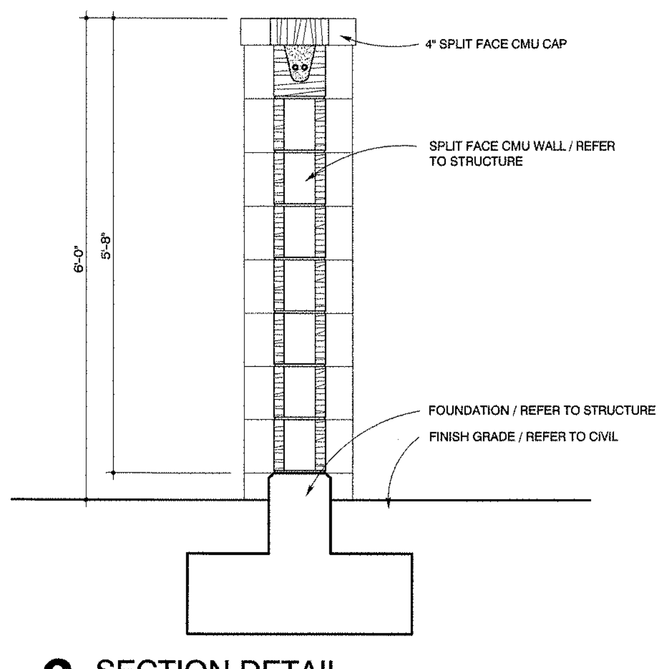
2 SECTION DETAIL
METAL GATE TRACK AT CONCRETE PAVING
3/4" : 1'



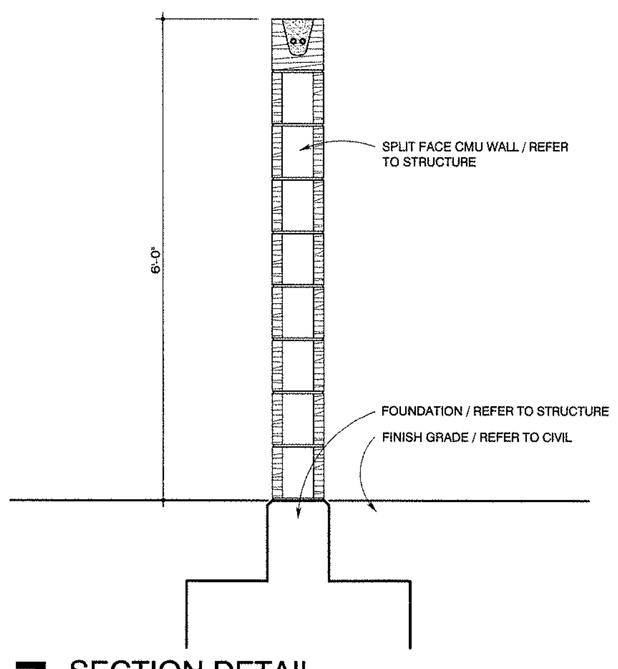
3 SECTION DETAIL
CONCRETE CURB WITH METAL GATE TRACKS
3/4" : 1'



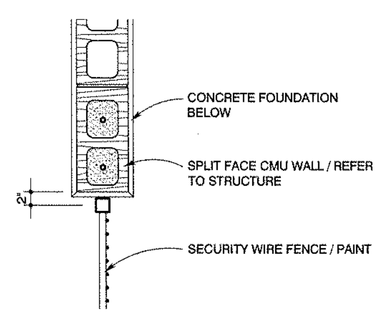
5 SECTION DETAIL
MONUMENT SIGN
3/4" : 1'



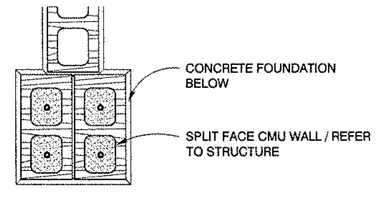
6 SECTION DETAIL
CMU WALL AT MAIN ENTRY
3/4" : 1'



7 SECTION DETAIL
CMU WALL - TYPICAL
3/4" : 1'

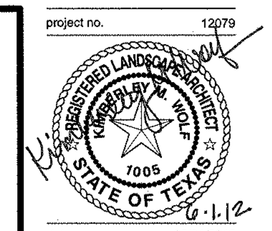


8 PLAN DETAIL
CMU TO METAL FENCE
3/4" : 1'



9 SECTION DETAIL
CMU COLUMN
3/4" : 1'

project no. 12079



6.1.12

date 08/01/2012

Frio Bulky Waste Collection Center

City of San Antonio Solid Waste Management Department
Frio City Road, San Antonio, TX

revisions:

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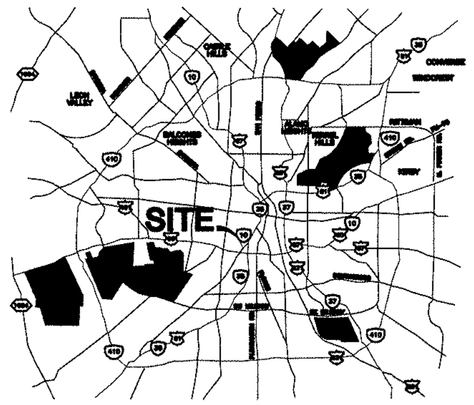
L-104

FENCE DETAILS



2 VICINITY MAP
NTS

PLAN NORTH / TRUE NORTH

1 PLANTING PLAN
OVERALL SITE
1" = 20'

LEGEND

- TURF SEED HYDROMULCH (ST); REF. PLANT MATERIALS SCHEDULE ON 1/L-201
- DECOMPOSED GRANITE MULCH; REF. 7/L-201
- R5 — ZONING INFORMATION/ BUFFERS
- ESPERANZA
- SOTOL
- AGARITA
- COMPACT CENIZO
- MEXICAN SALVIA
- PRICKLY PEAR W/ SPINES
- RED YUCCA

LANDSCAPE ORDINANCE

PROJECT MUST ACHIEVE 25 ELECTIVE POINTS

PARKING LOT SHADING — 20 POINTS
- PARKING LOT AREA: 25,449 SQUARE FEET (SF)
- SHADE AREA REQUIREMENT OF 25% FOR 20 PTS = 6,362 SF (SEE CALCULATIONS BELOW)

STREET TREES — 25 POINTS
- STREET TREES ALONG ORIENTAL AVE.: (315' x 75%) / 50 =5 TREES
- STREET TREES ALONG TRINITY ST.: (295' x 75%) / 50 = 4.4 OR 5 TREES

BUFFER YARDS
- TYPE 'A' PROVIDED ALONG S. TRINITY ST AND ORIENTAL AVE.

TREE PRESERVATION ORDINANCE

THERE ARE NO EXISTING TREES WITHIN THE PROJECT SITE
CANOPY COVERAGE: 15%

PARKING LOT SHADING CALCULATIONS						
Total Parking Lot Area =				25,449.00	SF	
Shade Coverage Required=				25%		
Shade Coverage Required=				6,362.25	SF	
QTY	SHADE VALUE					TREE ID
0	1200	@	100%	0.00	SF	
0	1200	@	75%	0.00	SF	BO
2	1200	@	50%	1,200.00	SF	BO
0	875	@	100%	0.00	SF	
2	875	@	75%	1,312.50	SF	QV
10	875	@	50%	4,375.00	SF	QV, UC
0	550	@	100%	0.00	SF	
0	550	@	75%	0.00	SF	QL
0	550	@	50%	0.00	SF	QL
0	275	@	100%	0.00	SF	
0	275	@	75%	0.00	SF	CC
0	275	@	50%	0.00	SF	CC
Total Shade Coverage Provided =				6,887.50		
Total Shade Coverage Provided =				27.06%		

TREE CANOPY CALCS *per UDC 35-523 (05/06/2010)*								
Total Project Area*(Gross) =				46,467.00	sf			
Total Canopy Required=				6,970.05	sf	15% Required PPR at CoSA on 5/8/2012		
Canopy Met with PRESERVED Trees - *Trees LESS than 17" Cal/per* - See Tree Preservation Plans								
QTY	SHADE VALUE					TREE SPECIES	TREE NO.	SIZE (cal inch)
0	1200	@	100%	0.00	sf	Pecan		
0	875	@	100%	0.00	sf	Hackberry		
0	875	@	100%	0.00	sf	Arizona Ash		
0	550	@	100%	0.00	sf			
0	275	@	100%	0.00	sf	Ashe Juniper		
0	275	@	100%	0.00	sf	Mesquite		
Canopy Met with PRESERVED Trees - *Trees LARGER than 17" Cal/per* - See Tree Preservation Plans								
QTY	SHADE VALUE PER CONVERSION 1" CAU 1' C					TREE SPECIES	TREE NO.	SIZE (cal inch)
0	0	@	100%	0.00	sf	Pecan		
Canopy Met with Proposed Tree Plantings - See Planting Plans								
QTY	SHADE VALUE					TREE SPECIES		
8	1200	@	90%	8,640.00	sf	BO		
12	875	@	90%	9,450.00	sf	UC, QV		
0	550	@	90%	0.00	sf	GT, QL, QT		
0	275	@	90%	0.00	sf	VA, IV, CB, QC, ID, DT ,PG, LR, MT, CH, CV, RC, JA, BC		
Total Canopy Provided =				18,090.00	sf			
Total Canopy Provided =				38.93%				

NOTES (◈ Keyed on Plan)

1. PROVIDE HYDROMULCH TURF (ST) IN AREAS DISTURBED BY CONSTRUCTION AND NOT SHOWN TO RECEIVE SOD.
2. PLANTING BED; REF. L-201 FOR LANDSCAPE MATERIALS SCHEDULE
3. STEEL EDGING (SE); REF. LANDSCAPE MATERIAL SCHEDULE AND 7/L-201
4. NOT USED
5. EXISTING PAVEMENT; REF. CIVIL
6. PROPOSED PAVEMENT; REF. CIVIL
7. 4" DEPTH OF DECOMPOSED GRANITE MULCH; REF. 6/L-201
8. 6' HT SECURITY WIRE FENCE
9. 36' WIDE X 6' HT SECURITY WIRE GATE
10. HARDWOOD MULCH OVER SOIL SEPARATION FABRIC; REF. DETAIL 5/L-201

project no. 12079

6.1.12

date 06/01/2012

Oriental Avenue and South Trinity Street

Frio Bulky Waste Collection Center

City of San Antonio Solid Waste Management Department
Frio City Road, San Antonio, TX 78226

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L-200
PLANTING PLAN

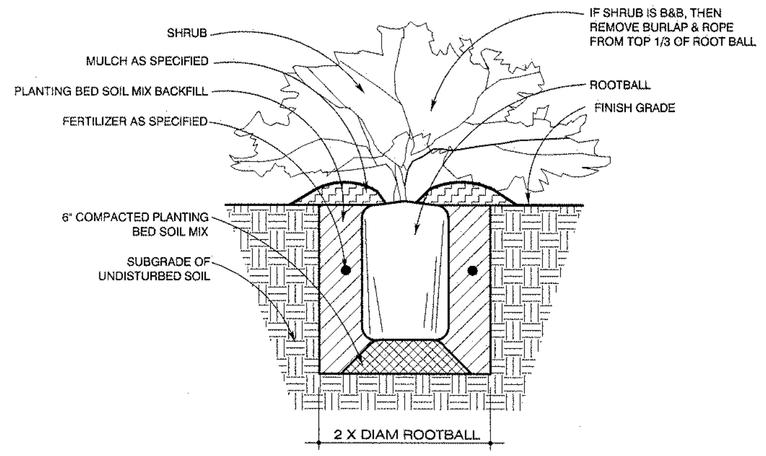
PLANT & LANDSCAPE MATERIALS SCHEDULE

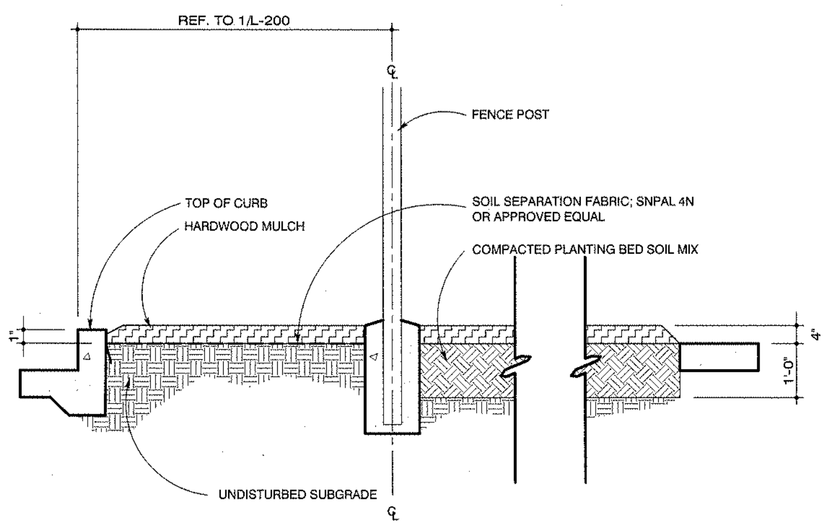
5/30/2012

SYM.	QTY.	SCIENTIFIC NAME	COMMON NAME	SIZE	CONDITION	MIN. HEIGHT	MIN. SPREAD	SPACING	REMARKS
TREES									
QMA	8	*Quercus macrocarpa*	BURR OAK	3" CAL.	CONTAINER GROWN	14'-16' MIN.	5'-7' MIN.	PER PLAN	SINGLE TRUNK
QV	7	*Quercus virginiana*	LIVE OAK	3" CAL.	CONTAINER GROWN	14'-16' MIN.	5' MIN.	PER PLAN	SINGLE TRUNK
UC	5	*Ulmus crassifolia*	CEDAR ELM	3" CAL.	CONTAINER GROWN	14'-16' MIN.	3' MIN.	PER PLAN	SINGLE TRUNK
SHRUBS									
BT	44	*Berberis trifoliata*	AGARITA	3 GAL.					
LFC	42	*Leucophyllum frutescens 'Compact'*	COMPACT CENIZO	5 GAL.		12"-14"	10"-12"	48" O.C.	
TS	6	*Tecoma stans var. 'angustata'*	ESPERANZA	5 GAL.		3'-4'	15"-18"	42" O.C.	
GRASSES									
SM	24	Salvia mexicana	MEXICAN SALVIA	5 GAL		10"-12"	8"-10"	36" O.C.	
YUCCA/CACTI									
DT	6	*Dasylirion texanum*	SOTOL	5 GAL.		16"-18"	18"-20"	48" O.C.	
HP	51	*Hesperaloe parviflora*	RED YUCCA	5 GAL.		15"-18"	Full	36" O.C.	
OL	27	*Opuntia engelmannii lindheimeri*	PRICKLY PEAR	5 GAL		12"-15"	12'-15"	36" O.C.	3 PADS MIN.
TURF									
ST	30,030 SF	*BUFFALO & BLUE GRAMA 80/20 MIX*	SUN TURF GRASS	REQ'D					AVAILABLE FROM NATIVE AMERICAN SEED; 800.728.4043; ITEM# 2850
MISCELLANEOUS									
SE	106 LF		STEEL EDGER	1/8" x 4"					SEE SPECIFICATIONS
DG	15 CY		DECOMPOSED GRANITE	4" DEPTH					REFER TO DTL. XX/L-XX

NOTE:
CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS ON THE SITE.
CONTRACTOR TO VERIFY ALL QUANTITIES. QUANTITIES LISTED IN THE PLANT SCHEDULE ARE TO BE USED AS A GUIDE ONLY.

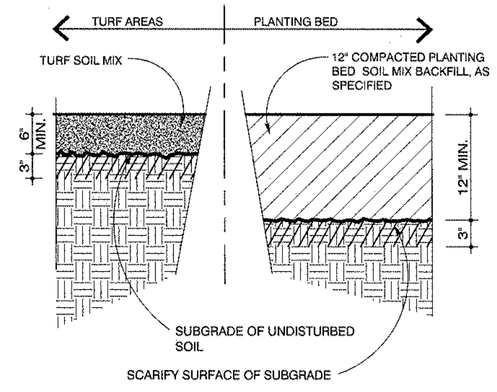
1 LANDSCAPE MATERIALS SCHEDULE





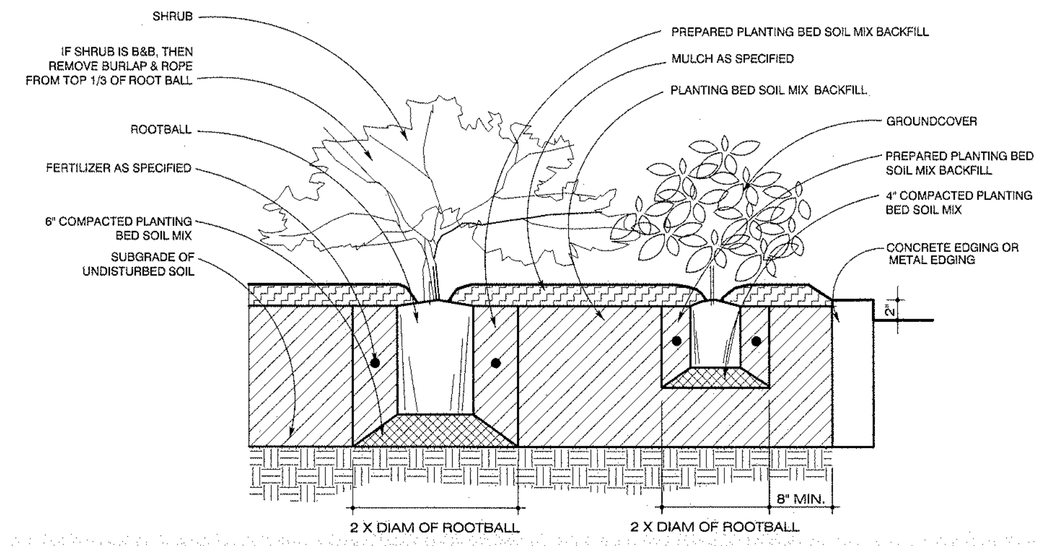
2 SOIL PREPARATION

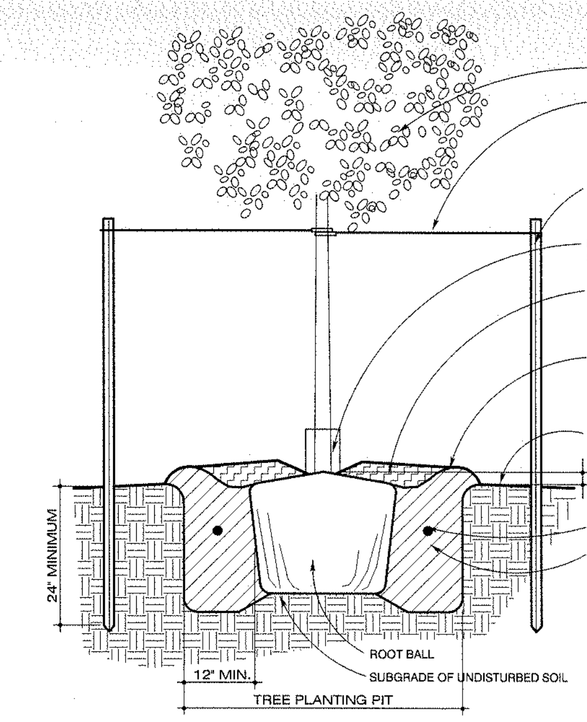
NEW PLANTINGS
NTS



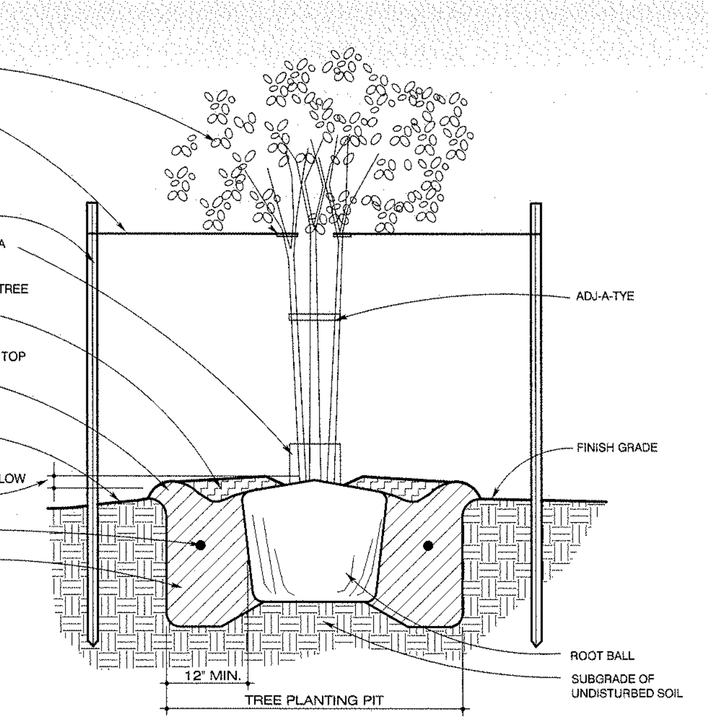
3 SHRUB AND GROUNDCOVER PLANTING

NEW PLANTINGS IN CONTINUOUS PLANTING BEDS
NTS





SINGLE STEM TREE



MULTI-STEM TREE

NOTE:
1. PLACE STAKES IN THE DIRECTION OF PREDOMINATE WINDS OF THE AREA.
2. TREE PLANTING PIT TO BE AT LEAST TWICE THE DIAMETER OF THE ROOT BALL
3. REMOVE BURLAP WRAP & ROPES/ CABLES FROM ROOT BALL
4. BREAK UP SIDES AND BOTTOM OF TREE HOLE SO ROOTS CAN PENETRATE BASE MATERIAL

4 SHRUB PLANTING

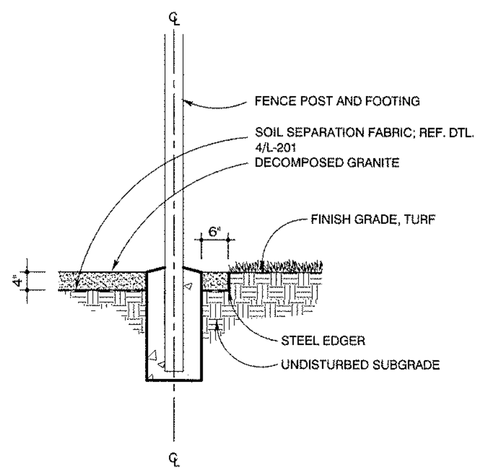
NEW PLANTING - INDIVIDUAL PLANTING PIT
NTS

5 HARDWOOD MULCH MAINTENANCE STRIP

NEW PLANTINGS
1/2" = 1'-0"

6 TREE PLANTING

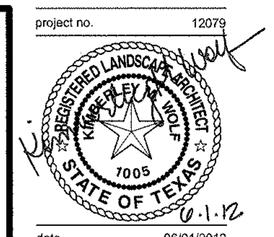
NEW PLANTINGS
NTS



7 DECOMPOSED GRANITE MULCH MAINTENANCE STRIP

NEW PLANTINGS
1/2" = 1'-0"

project no. 12079



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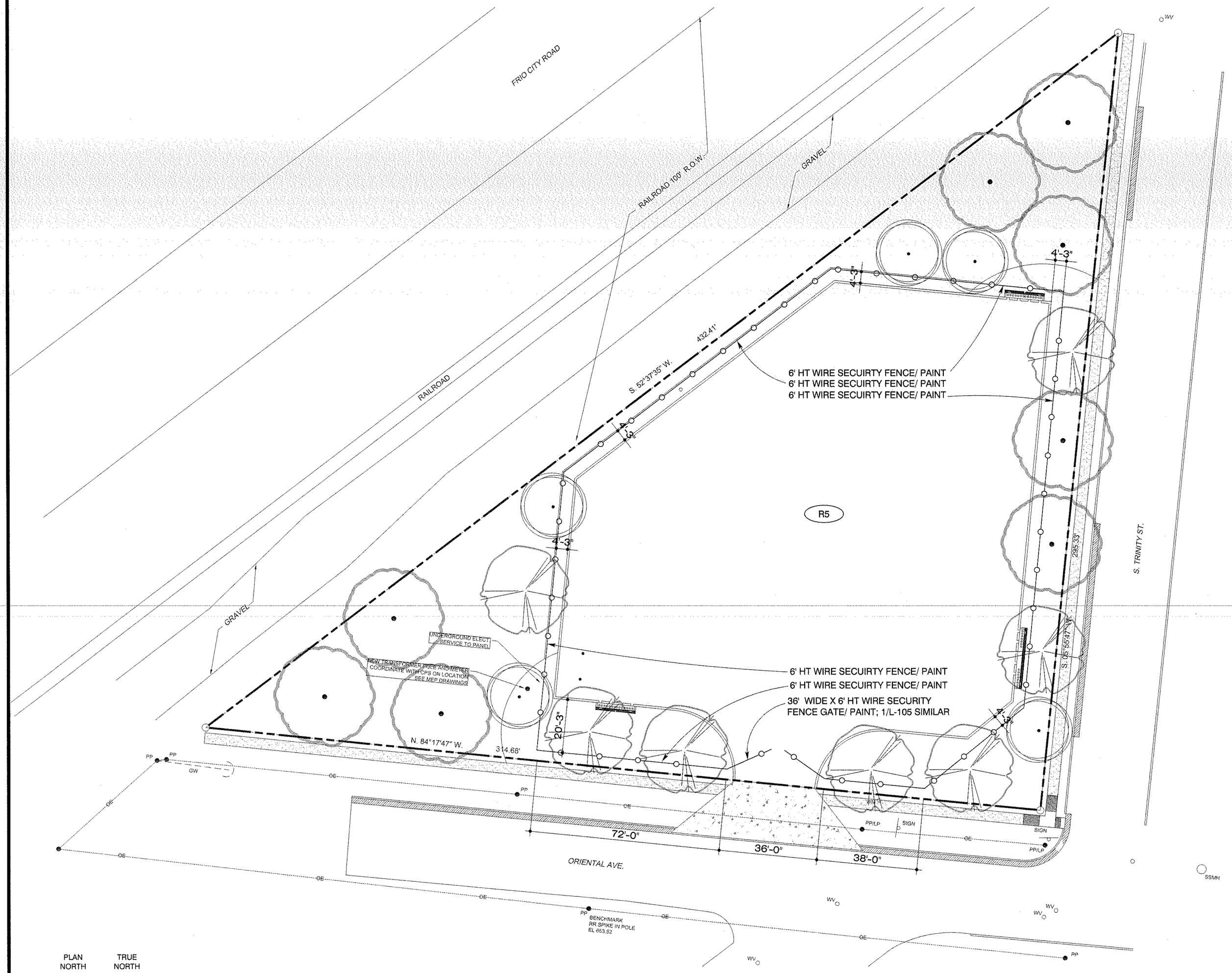
L-201

LANDSCAPE MATERIALS SCHEDULE & PLANTING DETAILS



PLAN NORTH

TRUE NORTH

1 FENCE PLAN
WIRE SECURITY FENCE
1" = 20'

project no. 12079

REGISTERED LANDSCAPE ARCHITECT
KIMBERLEY M. WOLF
7005
STATE OF TEXAS
6.1.12

date 06/01/2012

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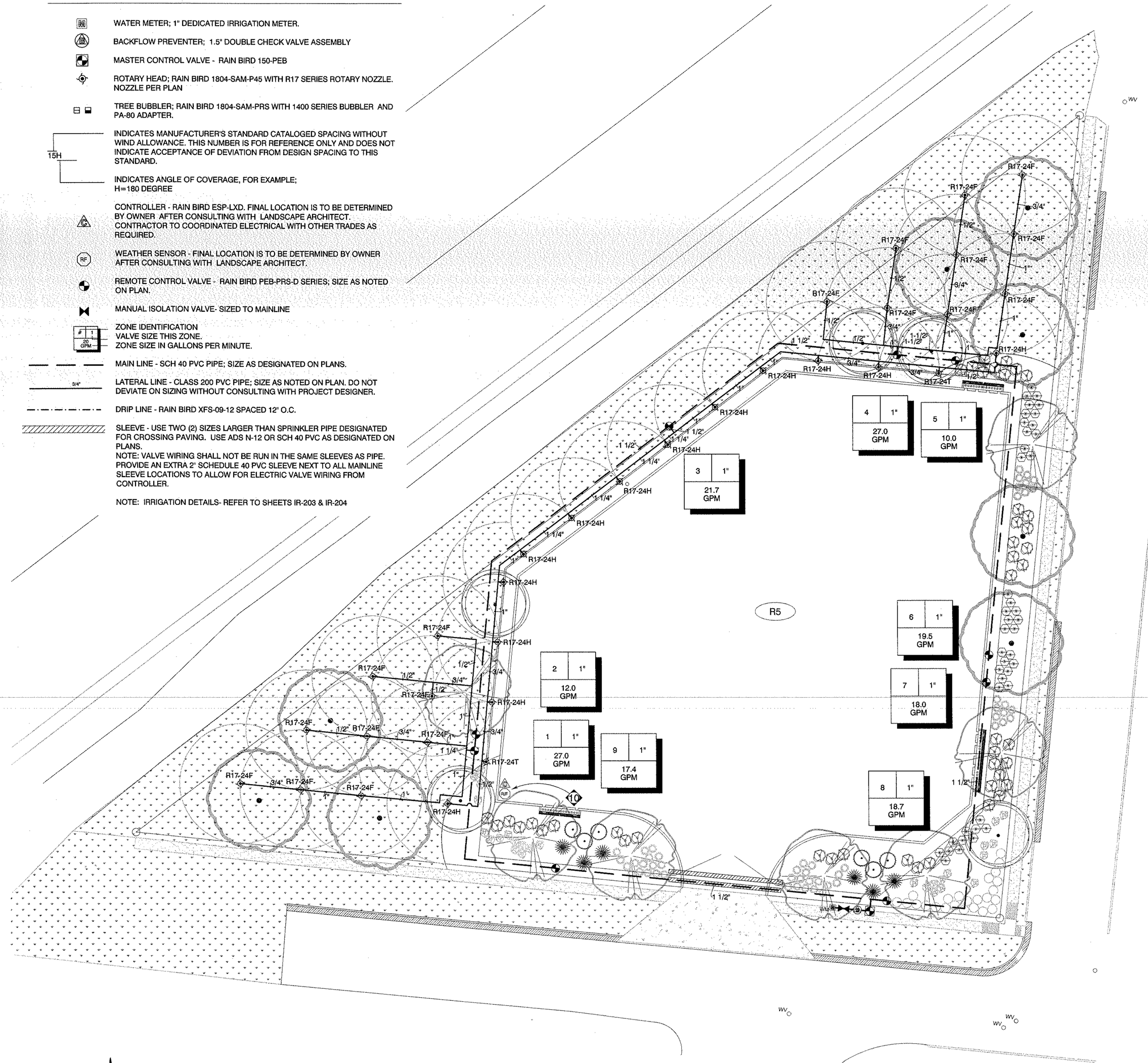
L-202
FENCE PLAN

LEGEND

- WATER METER; 1" DEDICATED IRRIGATION METER.
- BACKFLOW PREVENTER; 1.5" DOUBLE CHECK VALVE ASSEMBLY
- MASTER CONTROL VALVE - RAIN BIRD 150-PEB
- ROTARY HEAD; RAIN BIRD 1804-SAM-P45 WITH R17 SERIES ROTARY NOZZLE. NOZZLE PER PLAN
- TREE BUBBLER; RAIN BIRD 1804-SAM-PRS WITH 1400 SERIES BUBBLER AND PA-80 ADAPTER.
- 15H — INDICATES MANUFACTURER'S STANDARD CATALOGED SPACING WITHOUT WIND ALLOWANCE. THIS NUMBER IS FOR REFERENCE ONLY AND DOES NOT INDICATE ACCEPTANCE OF DEVIATION FROM DESIGN SPACING TO THIS STANDARD.
- INDICATES ANGLE OF COVERAGE, FOR EXAMPLE; H=180 DEGREE
- CONTROLLER - RAIN BIRD ESP-LXD. FINAL LOCATION IS TO BE DETERMINED BY OWNER AFTER CONSULTING WITH LANDSCAPE ARCHITECT. CONTRACTOR TO COORDINATED ELECTRICAL WITH OTHER TRADES AS REQUIRED.
- RF — WEATHER SENSOR - FINAL LOCATION IS TO BE DETERMINED BY OWNER AFTER CONSULTING WITH LANDSCAPE ARCHITECT.
- REMOTE CONTROL VALVE - RAIN BIRD PEB-PRS-D SERIES; SIZE AS NOTED ON PLAN.
- MANUAL ISOLATION VALVE- SIZED TO MAINLINE
- # — ZONE IDENTIFICATION; 20 GPM — ZONE SIZE IN GALLONS PER MINUTE.
- MAIN LINE - SCH 40 PVC PIPE; SIZE AS DESIGNATED ON PLANS.
- 3/4" — LATERAL LINE - CLASS 200 PVC PIPE; SIZE AS NOTED ON PLAN. DO NOT DEVIATE ON SIZING WITHOUT CONSULTING WITH PROJECT DESIGNER.
- DRIP LINE - RAIN BIRD XFS-09-12 SPACED 12" O.C.
- SLEEVE - USE TWO (2) SIZES LARGER THAN SPRINKLER PIPE DESIGNATED FOR CROSSING PAVING. USE ADS N-12 OR SCH 40 PVC AS DESIGNATED ON PLANS.
  NOTE: VALVE WIRING SHALL NOT BE RUN IN THE SAME SLEEVES AS PIPE. PROVIDE AN EXTRA 2" SCHEDULE 40 PVC SLEEVE NEXT TO ALL MAINLINE SLEEVE LOCATIONS TO ALLOW FOR ELECTRIC VALVE WIRING FROM CONTROLLER.

NOTE: IRRIGATION DETAILS- REFER TO SHEETS IR-203 & IR-204



PLAN NORTH / TRUE NORTH

1 IRRIGATION PLAN - TURF
NEW SYSTEM
1" : 20'

NOTES (keyed ◇# note)

1. Irrigation contractor shall be responsible for making himself familiar with the specifications and all submittal requirements. It is the responsibility of the Irrigation contractor to notify the Owner's Representative for site inspections as specified in the specifications. Failure to notify the Owner's Representative does not relieve the contractor from inspection approval and will require the contractor to uncover work as required for approval at the cost of the contractor. Irrigation contractor is to inform Owner's Representative of the start date of work.
2. All irrigation work shall be installed under the supervision of a licensed (in the State of Texas) irrigation contractor.
3. The irrigation contractor is required by law to notify Texas One Call (800-245-4545) 72 hours prior to any excavation. Irrigation contractor shall be responsible for making himself familiar with all underground utilities, pipes and structures. Irrigation contractor shall take sole responsibility for any cost incurred due to damage of said utilities whether or not Texas One Call is notified.
4. Do not willfully proceed with construction as designed without verifying actual on-site water pressure from the source. Do not willfully proceed with construction as designed when it is obvious that unknown obstructions and/or grade differences exist that may not have been known during design. Such conditions shall be immediately brought to the attention of the Owner's Representative. The Irrigation contractor shall assume full responsibility for all necessary revisions due to failure to give such notification.
5. Irrigation contractor shall be responsible for any coordination with other contractors as required to accomplish irrigation installation.
6. Due to scale of drawings, it is not possible to indicate all offsets, fittings sleeves, etc., which may be required. Irrigation contractor shall carefully investigate the structural and finished conditions affecting all of his work and plan his work accordingly, furnishing such fittings, etc., as may be required to meet such conditions. Drawings are generally diagrammatic and indicative of the work to be installed. The work shall be installed in such a manner as to avoid conflicts between irrigation system, planting and architectural features. This design is diagrammatic. All piping, valves, etc., shown within paved areas is for design clarification only and shall be installed in planting areas and within property lines.
7. It is the Irrigation contractor's responsibility to coordinate piping with the landscape subcontractor to avoid conflict with planting beds. It will be the responsibility of the irrigation subcontractor to move piping to allow proper placement of plant material.
8. NO MACHINE TRENCHING IS TO BE DONE WITHIN DRIP LINE OF TREES. Trenching is to be done by hand or by tunneling under root system by method approved by Owner's Representative. Do not encroach more than 40% of the tree RPZ when trenching parallel. For lateral piping within the RPZ, trench to reach head location approaching on radius with branching structure of root system. Piping layout is diagrammatic and piping shall be routed around existing plant material to avoid damage. Do not cut any root over 3/4" diameter. Any cuts made shall be clean and without frayed ends
9. Irrigation contractor shall be responsible for sleeves and chases wherever piping or conduit passes, under all paving, through walls, etc. All sleeve locations may not be shown on plan, coordinate with architectural and civil drawings, general contractor and other subcontractors as required. All sleeve and chase locations are not noted on plan. All sleeves shall be ADS N-12 or Schedule 40 PVC sized twice the diameter of pipe or combination of pipes enclosed within the sleeve.

◇10 Install the irrigation controller and weather sensors on Kindorf frame just inside the curb at the southwest corner of the storage lot. Hardwire sensors to irrigation controller. Coordinate location and installation of controller and sensors with Owner's Representative. Coordinate installation of all required conduits with other trades.

11. All un-designated end lateral piping shall be 1/2" in rotary and spray zones.
12. All sprinkler heads shall have flexible attachment.
13. All sprinkler heads shall have factory installed check valves.
14. Design provides coverage only in the areas indicated.
15. Sub-surface drip tubing shall be Rain Bird XFS-09-12 space 12" O.C in planting beds.
16. Sub-surface drip tubing and fittings shall be of the same manufacturer unless indicated otherwise on drawings.
17. Supply and discharge headers in sub-surface drip zones shall be sized not to exceed three feet per second. (3/4" minimum)
18. Obtain coverage test approval from Owner's Representative prior to planting, sodding or seeding.
19. Refer to civil drawings for grading plan.

project no. 12079

STATE OF TEXAS — DON WEISS — 2239 — LICENSED IRRIGATOR

date 06/01/2012

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IR-200

IRRIGATION PLAN - TURF

LEGEND

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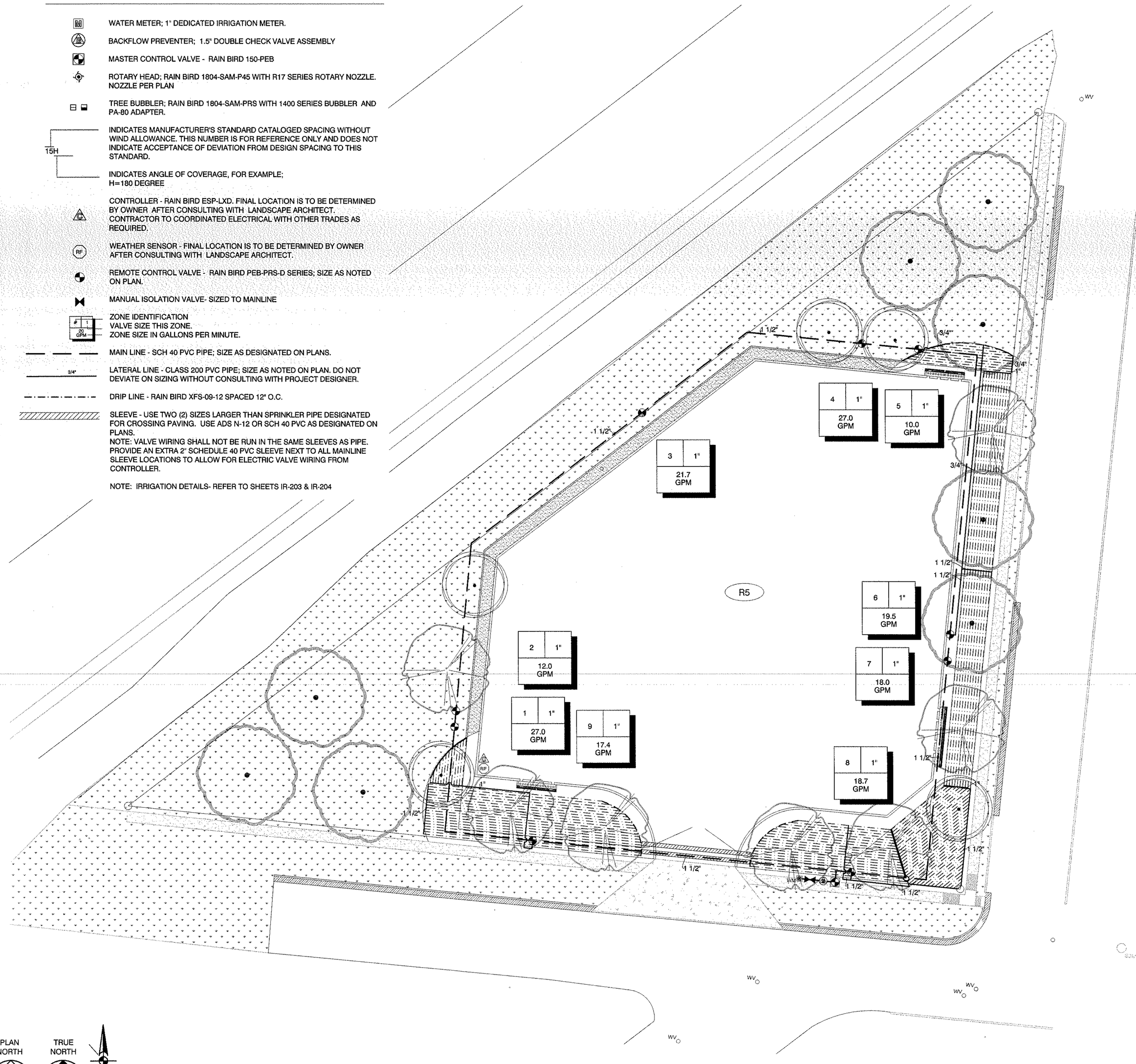

PLAN NORTH / TRUE NORTH

1 IRRIGATION PLAN - PLANTING BEDS
NEW SYSTEM
1" : 20'

project no. 12079

STATE OF TEXAS — DON WEISS — 2239 — LICENSED IRRIGATOR

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IR-201

IRRIGATION PLAN
PLANTING BEDS

LEGEND

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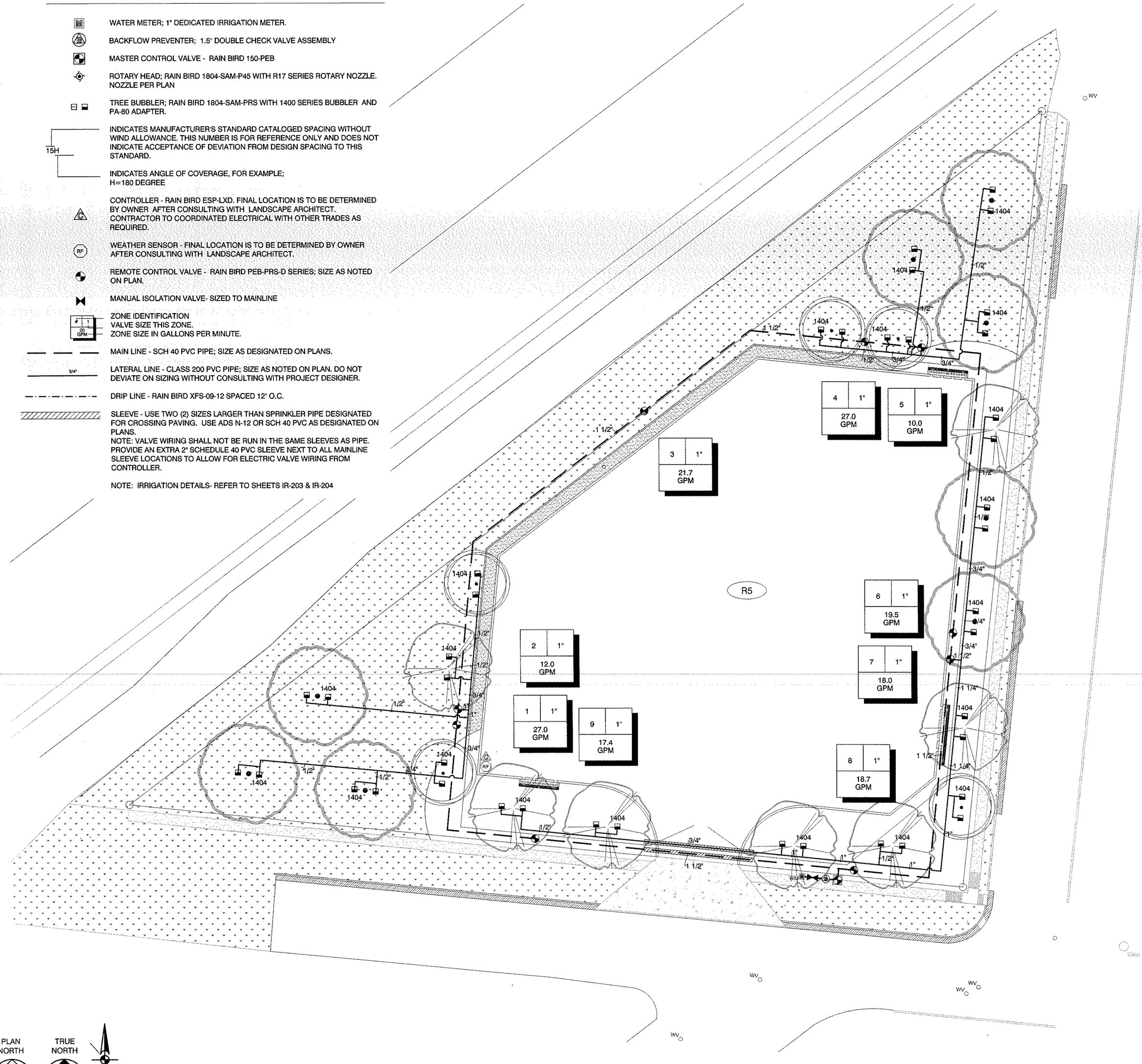

PLAN NORTH / TRUE NORTH

1 IRRIGATION PLAN - TREE BUBBLERS
NEW SYSTEM
1" : 20'

project no. 12079

STATE OF TEXAS — DON WEISS 2239 — LICENSED IRRIGATOR

date 06/01/2012

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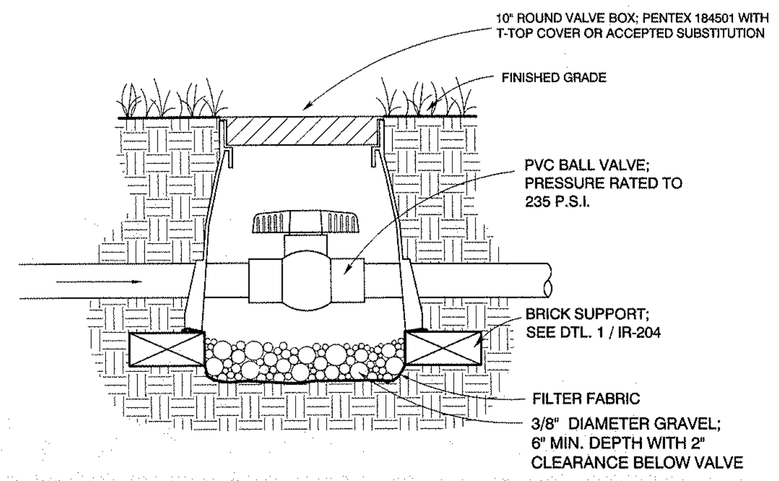
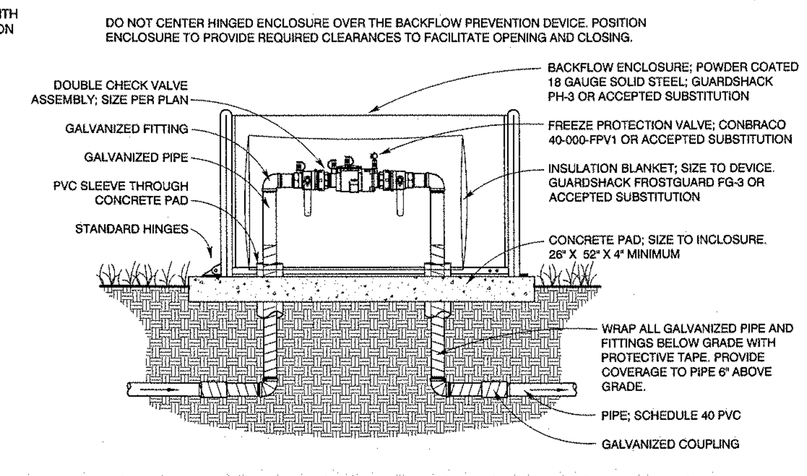
IR-202

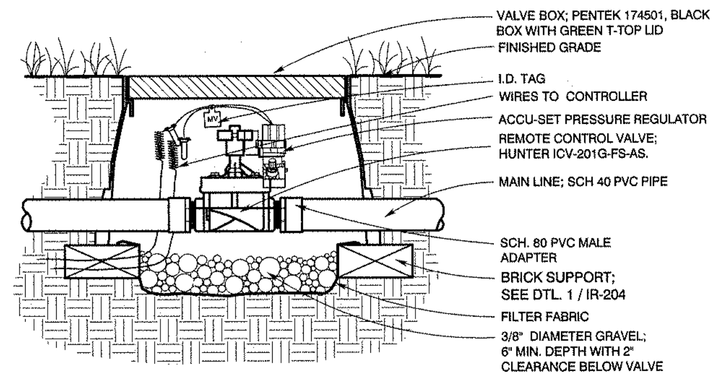
IRRIGATION PLAN
TREE BUBBLERS



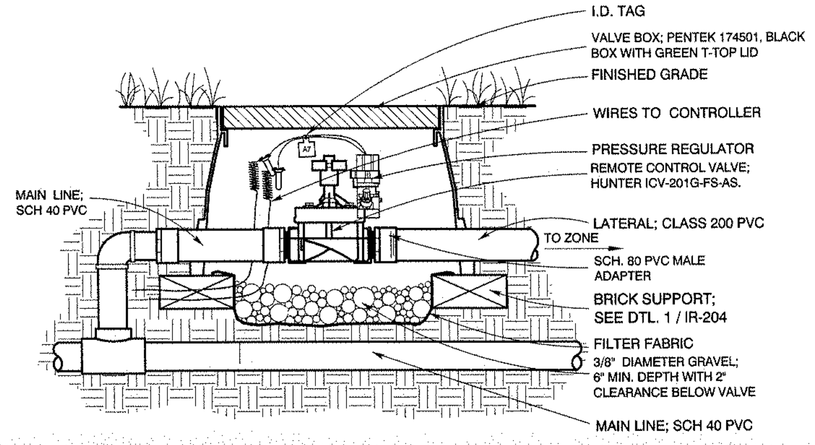
1 ISOLATION VALVE; PVC BALL VALVE
IRRIGATION
NOT TO SCALE



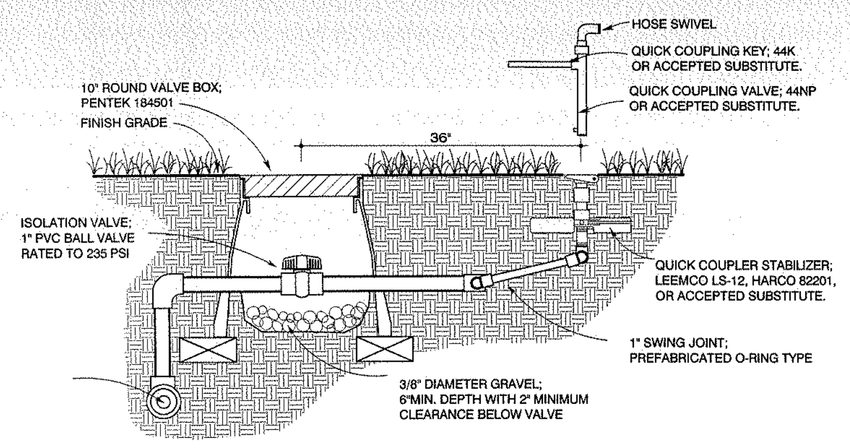
2 BACKFLOE PREVENTION DEVICE
IRRIGATION
NOT TO SCALE



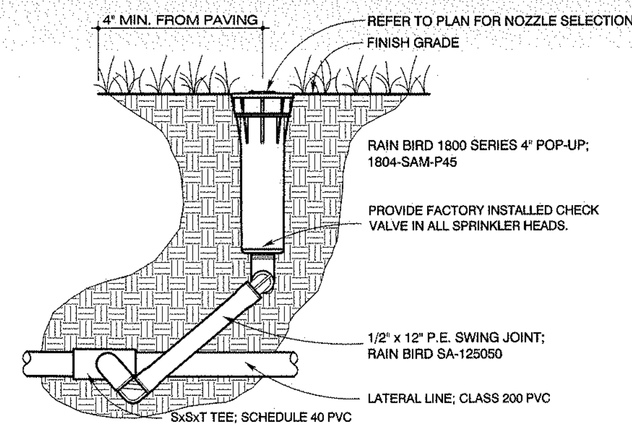
3 MASTER VALVE
IRRIGATION
NOT TO SCALE



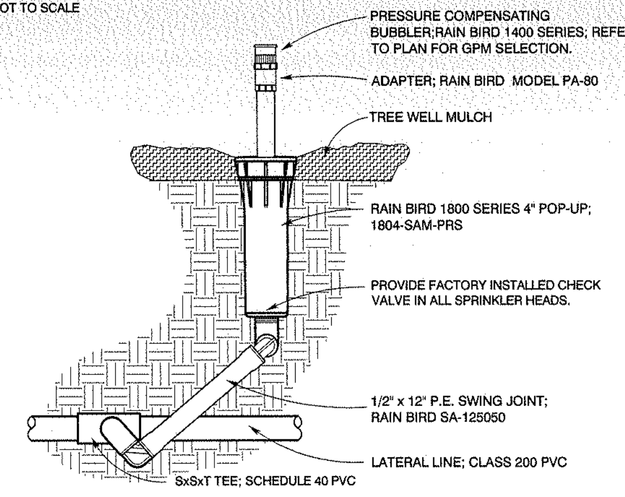
4 CONTROL VALVE
IRRIGATION
NOT TO SCALE



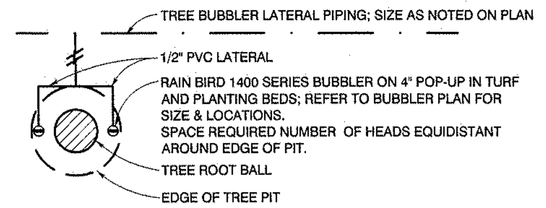
5 QUICK COUPLER VALVE
IRRIGATION
NOT TO SCALE



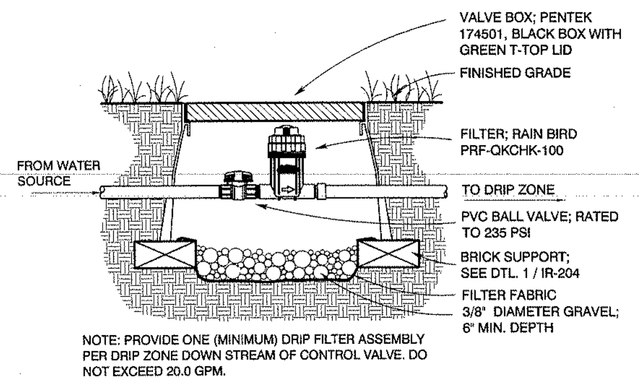
6 SMALL TURF ROTARY; 4" POP-UP
IRRIGATION
NOT TO SCALE



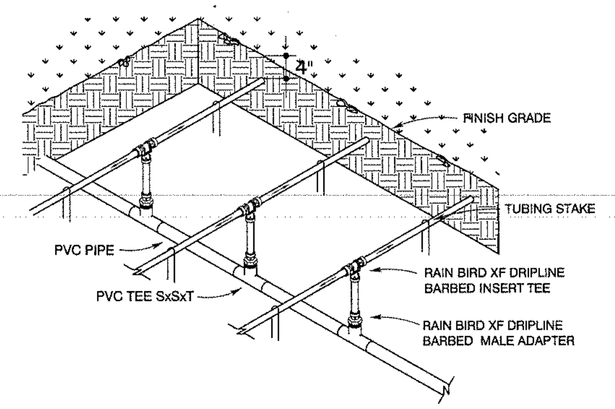
7 TREE BUBBLER
IRRIGATION
NOT TO SCALE



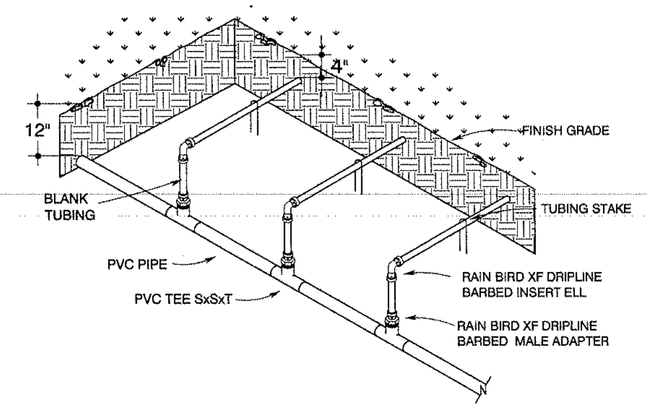
8 TREE BUBBLER ASSEMBLY
IRRIGATION
NOT TO SCALE



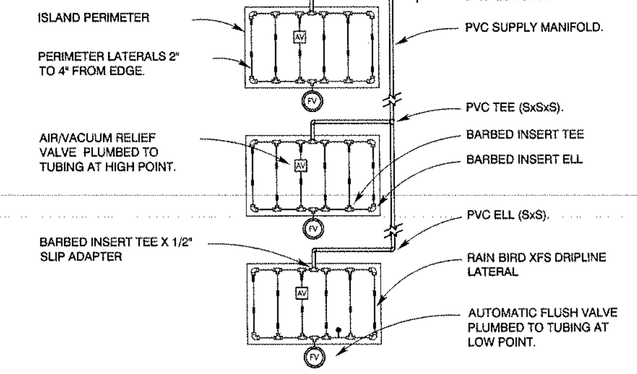
9 DRIP ZONE FILTER ASSEMBLY
IRRIGATION
NOT TO SCALE



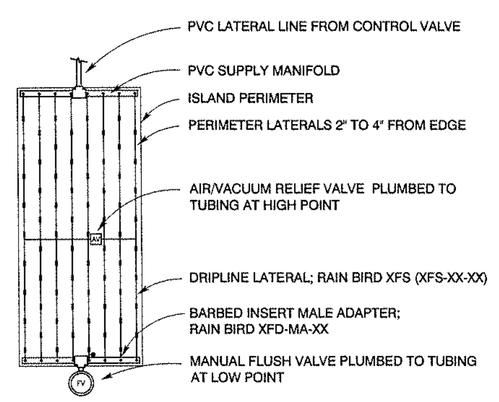
10 MANIFOLD - CENTER FEED
IRRIGATION
NOT TO SCALE



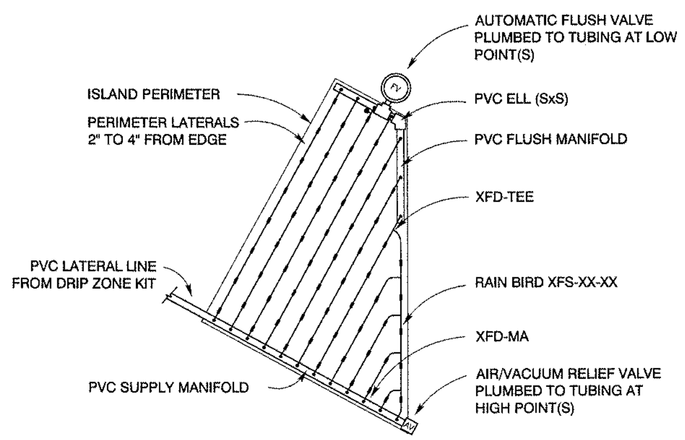
11 MANIFOLD - END FEED
IRRIGATION
NOT TO SCALE



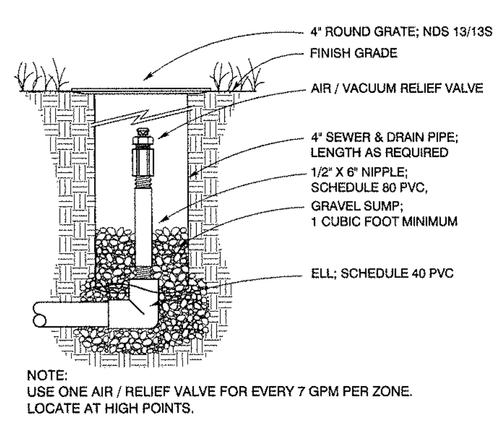
12 TYPICAL LAYOUT - PLANTER
IRRIGATION
NOT TO SCALE



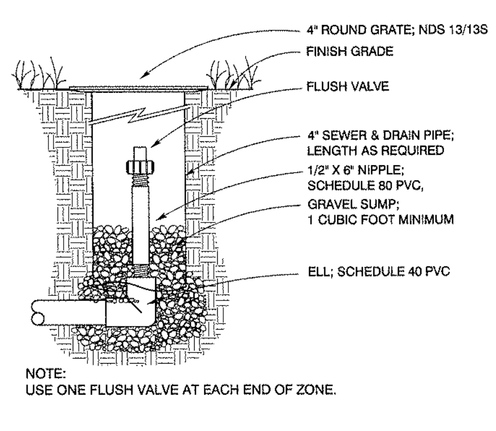
13 TYPICAL LAYOUT - END FEED
IRRIGATION



14 TYPICAL LAYOUT - TRIANGULAR
IRRIGATION
NOT TO SCALE



15 AIR/VACUUM RELIEF VALVE
IRRIGATION
NOT TO SCALE



16 FLUSH VALVE - PVC ELL
IRRIGATION
NOT TO SCALE

project no. 12079

STATE OF TEXAS — DON WEISS — 2239 — LICENSED IRRIGATOR

date 06/01/2012

Oriental Avenue and South Trinity Street

Frio Bulky Waste Collection Center

City of San Antonio Solid Waste Management Department
Frio City Road, San Antonio, TX 78226

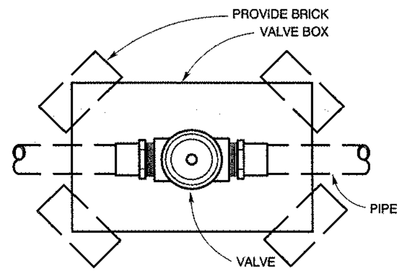
revisions:

RVK
architecture interior design landscape architecture
745 e mulberry ave suite 601
san antonio texas 78212
telephone: 210.733.3535
web: www.rvk-architects.com

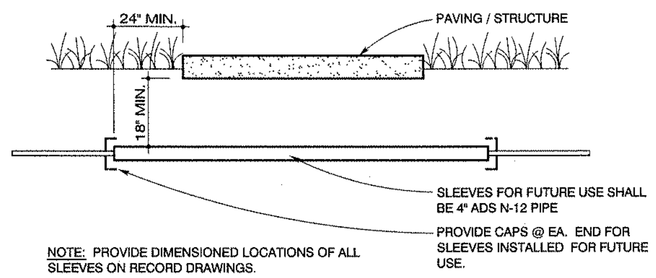
construction documents

IR-203

IRRIGATION DETAILS

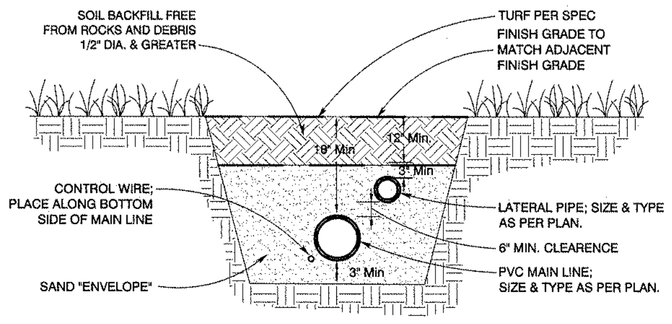


1 BRICK SUPPORT
IRRIGATION - PLAN VIEW
NOT TO SCALE



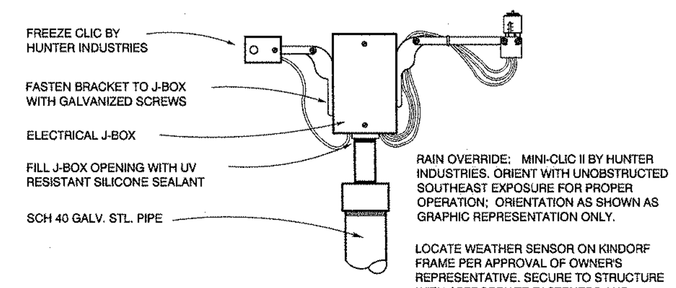
NOTE: PROVIDE DIMENSIONED LOCATIONS OF ALL SLEEVES ON RECORD DRAWINGS.

2 IRRIGATION SLEEVE
IRRIGATION
NOT TO SCALE



NOTE: WHEN WIRE/CABLE LEAVES TRENCH FROM MAINLINE, PLACE WIRE/CABLE IN 1" DIA. SCH 40 PVC GREY CONDUIT.
NO PIPE OR WIRE SHALL BE DEEPER THAN 24" BELOW FINISH GRADE.

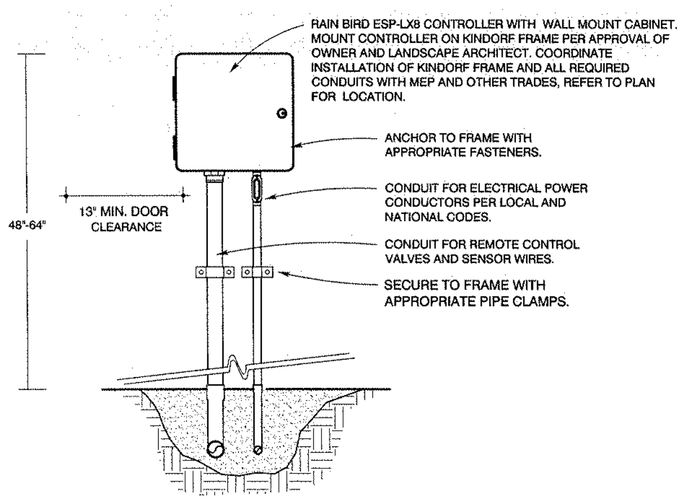
3 TRENCH CROSS SECTION
IRRIGATION
NOT TO SCALE



RAIN OVERRIDE: MINI-CLIC II BY HUNTER INDUSTRIES. ORIENT WITH UNOBSTRUCTED SOUTHEAST EXPOSURE FOR PROPER OPERATION; ORIENTATION AS SHOWN AS GRAPHIC REPRESENTATION ONLY.

LOCATE WEATHER SENSOR ON KINDORF FRAME PER APPROVAL OF OWNERS REPRESENTATIVE. SECURE TO STRUCTURE WITH APPROPRIATE FASTENERS AND HARDWARE. HARDWIRE TO SENSOR PORT IN CONTROLLER. WIRELESS UNITS ARE NOT ACCEPTABLE ON THIS PROJECT.

4 WEATHER SENSOR
IRRIGATION
NOT TO SCALE



5 CONTROLLER
IRRIGATION
NOT TO SCALE

PRESSURE REQUIREMENT CALCULATIONS @ ZONE No. 4			
DESIGN STATISTICS FOR CALCULATIONS			
Static Pressure (P.S.I.)			60.0
Total Zone Flow (G.P.M.)			27.0
ACCUMULATIVE LOSSES			
Service	Type 'K' Copper	1" x 10'	2.4
Irrigation Meter	Dedicated	1"	4.6
Backflow Preventer	Double Check Assembly	1.5"	4.0
Master Valve		1.5"	3.6
Main Line (Loop)	Sch 40 PVC	1.5" x 710 '	2.0
Zone Valve		1.5"	3.6
Zone Pipe / Fittings			1.5
Elevation (ft.)	Loss/Gain		0.0
TOTAL NET LOSSES			21.7
SPRINKLER HEAD REQUIREMENT (P.S.I.)			30.0
DESIGN PRESSURE			51.7
MINIMUM PRESSURE REQUIREMENT			54.3

NOTE:
System requires the minimum static pressure shown above for the system to operate properly.The Irrigation Contractor shall notify Owner's Repersenative of pressure deficiencies or any other site problems that may alter the system's performance.

STATEMENT OF IRRIGATION DESIGN STANDARDS CONFORMITY
This plan is complete and conforms to the design and installation parameters of the irrigation design standards set out in 35-510(j) and 35-511(c)(6) of the City of San Antonio UDC.

11 PRESSURE CALCULATIONS
IRRIGATION

BASE IRRIGATION SCHEDULE

Zone #	Plant Material	Sprinkler Type	Valve Size	GPM	Precip Rate	Demand (in/wk)	Run Time / WK (Minutes)	Cycles per Week	Minutes per Cycle	Split Cycle (Minutes)
1	Turf	Rotor	1	28.2	0.44	1.16	158	2	79	39
2	Tree	Bubbler	1	12.0	3.82	0.83	13	2	6	3
3	Turf	Rotor	1	23.2	0.46	1.16	151	2	75	38
4	Turf	Rotor	1	29.2	0.45	1.16	154	2	77	39
5	Tree	Bubbler	1	10.0	3.82	0.83	13	2	6	3
6	Shrub	Sub-Surface	1	19.5	0.96	0.99	62	2	31	15
7	Tree	Bubbler	1	18.0	3.82	0.83	13	2	6	3
8	Shrub	Sub-Surface	1	18.7	0.96	0.99	62	2	31	15
9	Shrub	Sub-Surface	1	17.4	0.96	0.99	62	2	31	15
Weekly Run Time Expressed in Hours							11.5		5.7	2.9

Monthly Seasonal Adjustments

January	33%	May	89%	September	80%		
February	44%	June	99%	October	61%		
March	60%	July	100%	November	40%		
April	73%	August	106%	December	32%		

*Watering schedules are calculated from historic monthly evapotranspiration averages for San Antonio, TX. Variation in seasonal weather may require irrigation run times to be adjusted.

12 BASE IRRIGATION SCHEDULE
IRRIGATION

project no. 12079

STATE OF TEXAS
DON WEISS
2239
LICENSED IRRIGATOR

date 06/01/2012

Oriental Avenue and South Trinity Street

Frio Bulky Waste Collection Center

City of San Antonio Solid Waste Management Department
Frio City Road, San Antonio, TX 78226

revisions:

RVK
architecture interior design landscape architecture
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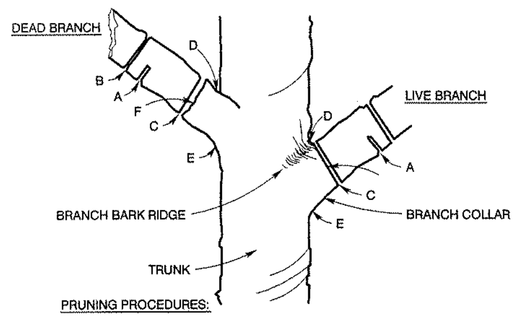
san antonio texas 78212
telephone: 210.733.3535
web: www.rvk-architects.com

construction documents

IR-204

IRRIGATION DETAILS



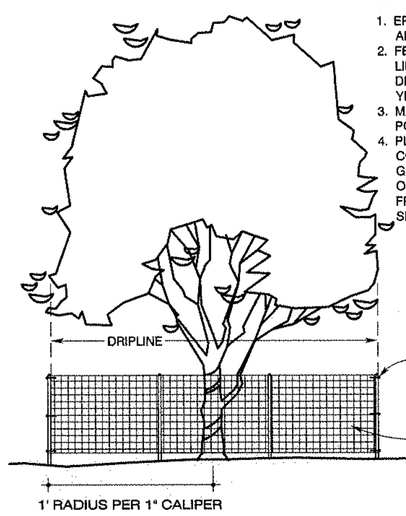
PRUNING PROCEDURES:

A. FIRST CUT - TO PREVENT BARK FROM PEELING WHEN BRANCH FALLS.
B. SECOND CUT - TO REDUCE WEIGHT OF BRANCH.
C. FINAL CUT - TO ALLOW FOR HEALING OF BRANCH COLLAR. LEAVE NO STUBS.
D. DO NOT CUT THROUGH BRANCH BARK RIDGE TO BASE OF BRANCH COLLAR.
E. BRANCH BARK RIDGE- PROPERLY INDENT TO REDUCE POTENTIAL FOR DECAY.
F. (FOR OAKS ONLY) PAINT ALL WOUNDS AND CUTS WITH PRUNING PAINT WITHIN 30 MINUTES TO PREVENT SPREAD OF OAK WILT.

NOTES:

1. EMPLOY A PROFESSIONAL ARBORIST; REFER TO SPECIFICATIONS FOR REQUIRED QUALIFICATIONS.
2. ARBORIST, OWNER, AND LANDSCAPE ARCHITECT SHALL REVIEW PRUNING WORK TO BE PERFORMED PRIOR TO INITIATING WORK.
3. SEE THIS DETAIL FOR PROPER PRUNING MEASURES REQUIRED FOR BRANCHES 1-1/2" OR GREATER IN DIAMETER.
4. REFER TO SPECIFICATIONS SECTIONS 01569 AND 02940 FOR MORE DETAILED REQUIREMENTS.

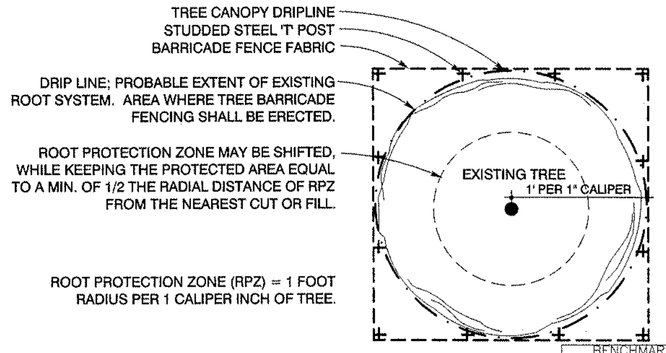
2 BRANCH PRUNING DETAIL
ALL PRESERVED TREES / TREES TO REMAIN
NTS



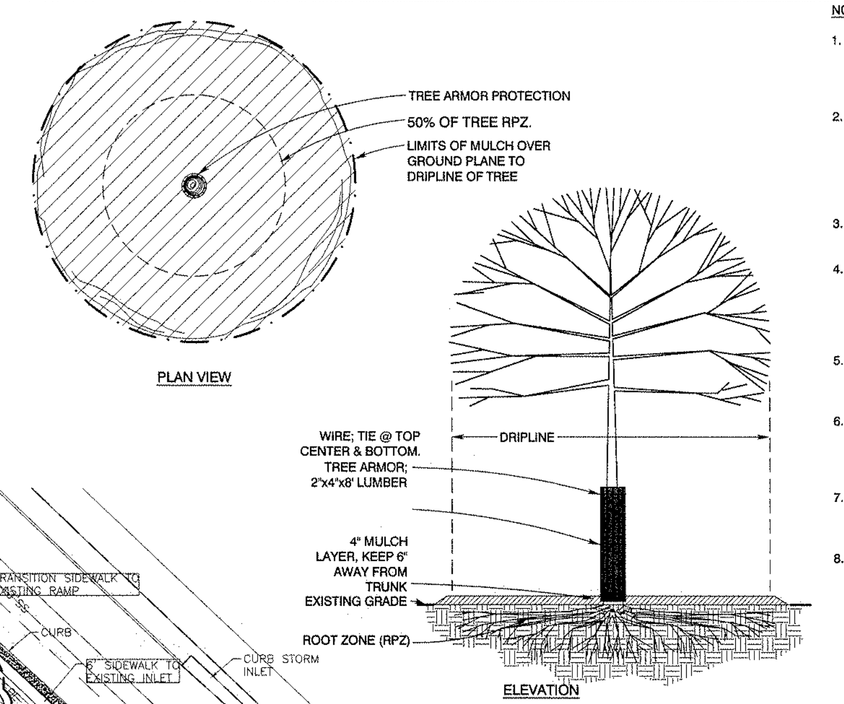
NOTES:

1. ERECT BARRICADE FENCING AROUND PERIMETER OF DRIPLINE.
2. FENCE FABRIC SHALL BE SQUARE LINK, ORANGE, 4'-0" HEIGHT, HIGH DENSITY POLYETHYLENE, WITH 5 - 7 YEAR LIFE EXPECTANCY.
3. MAXIMUM DISTANCE BETWEEN POSTS SHALL BE 10'-0".
4. PLACE AT A MINIMUM, 4" LAYER OF COURSE BARK MULCH TO ENTIRE GROUND PLANE BENEATH DRIPLINE OF THE TREE BUT KEPT BACK 6" FROM TRUNK. REFER TO DTL. 4/THIS SHEET.

3 TREE PROTECTION DETAIL
EXISTING TREES / TREES TO REMAIN
NTS



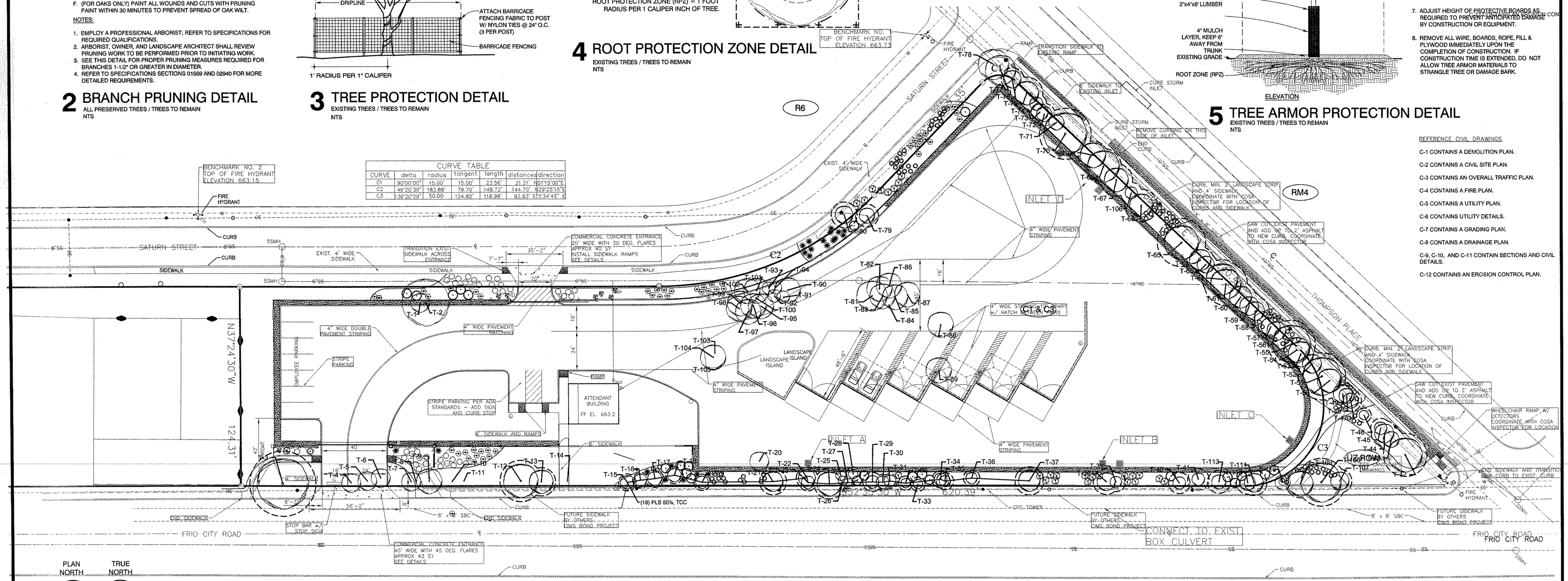
4 ROOT PROTECTION ZONE DETAIL
EXISTING TREES / TREES TO REMAIN
NTS



NOTES:

1. DETAIL APPLIES WHERE THE USE OF PROTECTIVE BARRICADE FENCING DOES NOT ALLOW SUFFICIENT MANEUVERING SPACE DURING CONSTRUCTION.
2. PLACE A 6" MINIMUM DEPTH COURSE MULCH OVER ENTIRE GROUND PLANE BENEATH DRIPLINE OF TREE. (UTILIZE MULCH AS REQUIRED TO PROVIDE A SMOOTH EVEN SURFACE IN AREAS WHERE TREE ROOTS ARE EXPOSED ABOVE EXISTING GRADE.
3. INSTALL TREE ARMOR BY WRAPPING 3-4 LAYERS OF BURLAP AROUND TRUNK OF TREE.
4. VERTICALLY STACK LUMBER (2X4X8'), BOARD TO BOARD AROUND ENTIRE TRUNK TO COVER BURLAP. WIRE TIE. DO NOT NAIL BOARDS SECURELY AROUND TRUNK AT TOP, CENTER & BOTTOM.
5. TEMPORARILY TIE UP ALL LIMBS IMPEDING CONSTRUCTION WITH HEAVY JUTE CORD TO REDUCE POTENTIAL DAMAGE TO LIMBS.
6. SUPPLEMENT MULCH LAYER THROUGHOUT COURSE OF CONSTRUCTION. MAINTAIN PROTECTIVE LAYER OF MULCH AT FULL 6" DEPTH.
7. ADJUST HEIGHT OF PROTECTIVE BOARDS AS REQUIRED TO PREVENT ANTICIPATED DAMAGE BY CONSTRUCTION OR EQUIPMENT.
8. REMOVE ALL WIRE, BOARDS, ROPE, FILL & PLYWOOD IMMEDIATELY UPON THE COMPLETION OF CONSTRUCTION. IF CONSTRUCTION TIME IS EXTENDED, DO NOT ALLOW TREE ARMOR MATERIALS TO STRANGLE TREE OR DAMAGE BARK.

5 TREE ARMOR PROTECTION DETAIL
EXISTING TREES / TREES TO REMAIN
NTS



CURVE TABLE						
CURVE	delta	radius	tangent	length	distance	direction
C1	90°00'00"	15.00'	15.00'	23.56'	21.21'	N51°15'00"E
C2	46°20'30"	183.88'	78.70'	148.72'	144.70'	N29°25'15"E
C3	136°20'29"	50.00	124.82'	118.98'	92.83'	S15°34'45" E

PLAN NORTH / TRUE NORTH

1 TREE PRESERVATION PLAN
OVERALL SITE
1" = 30'

SYMBOLS LEGEND

- TREE TO BE REMOVED
- TREE TO BE PRESERVED
- PLS — PRESERVED TREE UTILIZED FOR LANDSCAPE ORDINANCE PARKING LOT SHADING CALCULATIONS
- TCC — PRESERVED TREE UTILIZED FOR TREE CANOPY COVERAGE UNDER THE TREE PRES. ORDINANCE
- CONSTRUCTION STAGING AREA

NOTES (◈ Keyed on Plan)

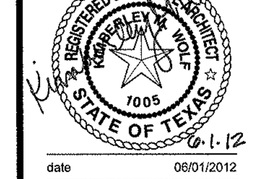
1. TREE SURVEY INFORMATION IS BASED ON SITE SURVEY PREPARED BY _____
2. A TREE INVENTORY AND PRESERVATION SCHEDULE ARE INCLUDED ON THIS SHEET AND ARE PART OF THESE CONSTRUCTION DOCUMENTS. A COPY OF THE PROJECT SPECIFICATIONS MUST ACCOMPANY CONSTRUCTION DOCUMENTS AT ALL TIMES.
3. ALL TREES TO REMAIN ON SITE REQUIRE PROTECTIVE BARRICADE FENCING AND OR ARMOR PROTECTION, MULCHING, PRUNING, WATERING, AND FERTILIZATION AS DIRECTED BY A QUALIFIED ARBORIST.
4. ANY CONDITION NECESSITATING THE REMOVAL OR PRUNING OF A TREE SHALL BE REVIEWED BY LANDSCAPE ARCHITECT, OWNER, AND ARBORIST. LOCATIONS OF ANY IMPROVEMENTS BEARING POTENTIAL OF IMPACTING TREES SHALL BE STAKED/DELINEATED PRIOR TO THE FIELD REVIEW AND ONSET OF ANY CONSTRUCTION ACTIVITIES.
5. REMOVAL OF ANY TREE(S) SCHEDULED FOR PRESERVATION MUST BE DOCUMENTED BY CONTRACTOR DURING PROCESS OF CONSTRUCTION. DOCUMENTS SHALL BE SUBMITTED TO THE LANDSCAPE ARCHITECT FOR RECONCILIATION AT END OF PROJECT TO GAIN APPROVAL BY CITY ARBORIST, AND IN COORDINATION FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
6. PRIOR TO SITE CLEARING OPERATIONS:
   A. LAYOUT PARKING LOT AND BUILDING FOOTPRINT.
   B. PLACE 4" LAYER OF COURSE MULCH OVER GROUND PLANE OF ALL DISTURBED AREAS & BENEATH ALL REMAINING TREES AS SPECIFIED.
   C. ERECT PROTECTIVE BARRICADE FENCING AROUND TREES INDICATED ON PLAN TO REMAIN. TREES UNABLE TO BE FENCED-OFF DUE TO CLEARANCES REQUIRED FOR CONSTRUCTION ARE TO BE PROTECTED WITH TREE ARMOR.
   D. OBTAIN APPROVAL FOR TREE PROTECTION FROM TREE INSPECTOR.
   E. PERFORM SITE CLEARING.
7. ALL EXISTING TREES ARE TO REMAIN UNLESS INDICATED OTHERWISE. TREES SHALL BE REMOVED ONLY UNDER THE FOLLOWING CONDITIONS:
   A. TREE IS INDICATED TO BE REMOVED; SEE LEGEND.
   B. CUT/FILL IS GREATER THAN FOUR (4'), OR EXCEEDS 50% OF THE ROOT PROTECTION ZONE(RPZ). RPZ IS DEFINED AS THE RADIAL DISTANCE OF 1 FOOT FROM TRUNK OF TREE FOR EACH CALIPER INCH(DBH) OF TRUNK. DBH IS DEFINED AS A DIAMETER OF TRUNK AT BREAST HEIGHT.
   C. CONSTRUCTION OF ANY BUILDING OR SITE IMPROVEMENT(S) WHICH REQUIRES THE REMOVAL OF MORE THAN 30% OF THE VIABLE PORTION OF THE TREE CANOPY.
8. BARRICADE FENCING SHALL BE STAKED IN FIELD BY CONTRACTOR'S REPRESENTATIVE, BEFORE ANY CONSTRUCTION RELATED ACTIVITIES BEGIN. PROTECT ALL TREES WITHIN 100' OF ANY CONSTRUCTION. REFER TO DTL. 3/THIS SHEET.
9. ERECT BARRICADE FENCING AROUND PERIMETER OF TREE, DIRECTLY BELOW DRIPLINE. ANY CONDITION WHERE CONSTRUCTION ENCROACHES WITHIN DRIP LINE, CONTRACTOR MAY ADJUST FENCING IN ORDER TO PREFORM WORK. IN NO INSTANCE SHALL THE FENCE BE ERECTED CLOSER THAN 1/2 THE DISTANCE OF THE RPZ. REF. TO DTL. 4/THIS SHEET.
10. ALL WOODY MATERIAL TO BE REMOVED SHALL BE CHIPPED INTO MULCH AND UTILIZED ON SITE. SUBSEQUENT MULCH MATERIAL IS TO BE SPREAD OVER AREAS DISTURBED ALONG UTILITY CORRIDORS AND WITHIN RPZ'S OF ALL TREES LOCATED WITHIN 100' OF ANY CONSTRUCTION ACTIVTY. ANY WOODY MATERIAL NOT USED IS TO BE REMOVED AND PROPERLY DISPOSED OF BY CONTRACTOR. IF MULCH MATERIAL PROCESSED FROM SITE DOES NOT PROVIDE AN ADEQUATE QUANTITY TO MEET MULCH REQUIREMENT, CONTRACTOR SHALL SUPPLIMENT AS REQUIRED TO ACCOMPLISH INTENT OF PLANS.
11. LAYOUT OF MAJOR SITE IMPROVEMENTS (BUILDING & PARKING LOT) IS TO BE COMPLETED BEFORE ANY DEMOLITION OF EXISTING TREES OR VEGETATION IS INITIATED. VEGETATION TO BE REMOVED IS TO BE CUT-OFF FLUSH WITH GRADE. IMMEDIATELY AFTER CUTTING. GRUB OUT STUMPS 6" BELOW EXISTING GRADE.
12. CONTRACTOR TO COORDINATE, REVIEW WITH, AND OBTAIN APPROVAL OF TREE PROTECTION BY A TREE INSPECTOR W/ THE CoSA ENVIRONMENTAL REVIEW DEPT. PRIOR TO THE INITIATION ANY WORK.
13. A 6-INCH LAYER OF COARSE MULCH SHALL BE SPREAD OVER ENTIRE AREA WITHIN DRIPLINE OF TREES TO PREVENT EXCESSIVE MOISTURE LOSS & PROTECTION AGAINST ROOT COMPACTION.
14. TREES TO BE PRESERVED SHALL BE PROTECTED UNTIL COMPLETION OF STAKING ALL CONCRETE WORK. IF DETERMINED THAT CONCRETE WORK WILL BE CLOSER THAN (6') TO ANY TREE, CONTRACTOR SHALL MEET WITH REPRESENTATIVES OF THE CITY OF SAN ANTONIO ENVIRONMENTAL REVIEW DEPARTMENT TO DETERMINE ACTION(S) TO MINIMIZE IMPACT.

TREE CANOPY CALCS *per UDC 35-523 (05/06/2010)*						
Total Project Area*(Gross) =				101,124.00	sf	
Total Canopy Required=				25,281.00	sf	
Canopy Met with PRESERVED Trees - *Trees LESS than 17" Caliper* - See Tree Preservation Plans						
QTY	SHADE VALUE			TREE SPECIES		TREE NO. SIZE (cal inch)
0	1200	@	100%	0.00	sf	Pecan
17	875	@	100%	14,875.00	sf	Hackberry
0	875	@	100%	0.00	sf	Arizona Ash
0	550	@	100%	0.00	sf	
0	275	@	100%	0.00	sf	Ashe Juniper
0	275	@	100%	0.00	sf	Mesquite
Canopy Met with PRESERVED Trees - *Trees LARGER than 17" Caliper* - See Tree Preservation Plans						
QTY	SHADE VALUE PER CONVERSION 1" CAL/ 1' C			TREE SPECIES		TREE NO. SIZE (cal inch)
0	0	@	100%	0.00	sf	Pecan
Canopy Met with Proposed Tree Plantings - See Planting Plans						
QTY	SHADE VALUE			TREE SPECIES		
3	1200	@	90%	3,240.00	sf	QM
12	875	@	90%	9,450.00	sf	QV,UC
0	550	@	90%	0.00	sf	GT, A, ,QL, QT
4	275	@	90%	990.00	sf	DT
Total Canopy Provided =				28,555.00	sf	
Total Canopy Provided =				28.24%		

REFERENCE CIVIL DRAWINGS

C-1 CONTAINS A DEMOLITION PLAN.
C-2 CONTAINS A CIVIL SITE PLAN.
C-3 CONTAINS AN OVERALL TRAFFIC PLAN.
C-4 CONTAINS A FIRE PLAN.
C-5 CONTAINS A UTILITY PLAN.
C-6 CONTAINS UTILITY DETAILS.
C-7 CONTAINS A GRADING PLAN.
C-8 CONTAINS A DRAINAGE PLAN.
C-9, C-10, AND C-11 CONTAIN SECTIONS AND CIVIL DETAILS.
C-12 CONTAINS AN EROSION CONTROL PLAN.

project no. 12079



date 06/01/2012

Frio Bulky Waste Collection Center
City of San Antonio Solid Waste Management Department
Frio City Road, San Antonio, TX 78226

revisions:

RVK
architecture interior design landscape architecture
745 e mulberry ave suite 601
san antonio texas 78212
telephone: 210.733.3535
web: www.rvk-architects.com

construction documents

TP-100
TREE PRESERVATION PLAN

1 TREE PRESERVATION INVENTORY

CITY OF SAN ANTONIO - 2006 Ordinance

TREE INVENTORY for

07-May-12

TAG #	SPECIES	DBH	CODE	SMALL SPECIES* 3.0" - 4.99" REMOVED	SMALL SPECIES* 3.0" - 4.99" PRESERVED	SMALL SPECIES* 5.0" - 11.99" REMOVED	SMALL SPECIES* 5.0" - 11.99" PRESERVED	SIGNIFICANT 6" - 23.99" REMOVED	SIGNIFICANT 6" - 23.99" PRESERVED	SIGNIFICANT SHORT LIVED 10.0" - 23.99" REMOVED	SIGNIFICANT SHORT LIVED 10.0" - 23.99" PRESERVED	HERITAGE SMALL SPECIES 1:1 12" + REMOVED	HERITAGE SMALL SPECIES 1:1 12" + PRESERVED	HERITAGE 3:1 24" + REMOVED	HERITAGE 3:1 24" + PRESERVED	HERITAGE SHORT LIVED 1:1 24" + REMOVED	HERITAGE SHORT LIVED 1:1 24" + PRESERVED	NOTES
T-1	PERSIMMON	6	P				6											
T-2	HACK	15	P								15							
T-3	MESQUITE	24	P														24	
T-4	HACK	6	P															
T-5	HACK	12	P								12							
T-6	HACK	6	P															
T-7	HACK	6	P															
T-8	HACK	8	P															
T-9	HACK	6	P															
T-10	HACK	10	P								10							
T-11	HACK	8	P															
T-12	HACK	18	P								18							
T-13	HACK	10	P								10							
T-14	HACK	24	P														24	
T-15	HACK	6	P															
T-16	HACK	24	P														24	
T-17	CHINA BERRY	18	P															
T-18	HACK	21	P								21							
T-19	HACK	24	P														24	
T-20	HACK	6	P															
T-21	HACK	10	P								10							
T-22	HACK	8	P															
T-23	HACK	6	P															
T-24	HACK	14	P								14							
T-25	HACK	4	P															
T-26	HACK	4	P															
T-27	HACK	10	P								10							
T-28	HACK	4	P															
T-29	HACK	15	P								15							
T-30	HACK	15	P								15							
T-31	HACK	18	P								18							
T-32	HACK	18	P								18							
T-33	HACK	20	P								20							
T-34	HACK	8	P															
T-35	HACK	6	R															
T-36	HACK	15	P								15							
T-37	HACK	10	P								10							
T-38	HACK	18	P								18							
T-39	HACK	6	R															
T-40	HACK	6	P															
T-41	HACK	4	P															
T-42	HACK	18	P								18							
T-43	HACK	6	R															
T-44	HACK	9	P															
T-45	HACK	6	P															
T-46	HACK	15	R								15							
T-47	HACK	6	R															
T-48	HACK	6	R															
T-49	HACK	8	R															
T-50	HACK	10	R								10							
T-51	HACK	20	P								20							
T-52	HACK	8	R															
T-53	HACK	6	P															
T-54	HACK	8	P															
T-55	HACK	22	P								22							
T-56	HACK	8	P															
T-57	HACK	8	P															
T-58	HACK	10	P								10							
T-59	HACK	10	P								10							
T-60	HACK	14	P								14							
T-61	HACK	16	P								16							
T-62	HACK	10	P								10							
T-63	HACK	8	P															
T-64	HACK	10	P								10							
T-65	HACK	18	P								18							
T-66	HACK	12	P								12							
T-67	HACK	16	P								16							
T-68	HACK	10	P								10							
T-69	HACK	18	P								18							
T-70	HACK	18	P								18							
T-71	HACK	6	r															
T-72	HACK	8	P															
T-73	HACK	9	P															
T-74	HACK	6	P															
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T-81	HACK	24	P														24	
T-81	HACK	18	R								18							
T-82	HACK	36	P														36	
T-83	HACK	30	P														30	
T-84	HACK	30	P														30	
T-85	HACK	24	P														24	
T-86	HACK	18	P								18							
T-87	HACK	15	P								15							
T-88	HACK	30	P														30	
T-89	HACK	12	R								12							
T-00	HACK	14	P								14							
T-91	HACK	28	P														28	
T-92	HACK	4	R															
T-93	HACK	4	R															
T-94	HACK	8	R															
T-95	HACK	6	R															
T-96	HACK	8	R															
T-97	HACK	18	R								18							
T-98	CHINABERRY	6	r															
T-99	HACK	6	r															
T-100	HACK	4	R															
T-101	HACK	6	R															
T-102	HACK	16	P								16							
T-103	CHINABERRY	4	r															
T-104	HACK	6	r															
T-105	HACK	16	P								16							
T-106	HACK	6	r															
T-107	HACK	12	r							12								
T-108	HACK	20	r							20								
T-109	HACK	12	r							12								
T-110	HACK	9	r															
T-111	HACK	12	r							12								
T-112	HACK	8	r															
T-113	HACK	6	r															
	SUBTOTALS (Inches)			0	0	0	0	0	0	56	672	0	0	0	0	0	328	
	TOTAL PER CATEGORY (Inches)			0		0		0			728		0		0		328	
	PERCENT PRESERVED					0		0			92%		0		0		100%	
	PERCENT PRESERVATION REQUIRED					40%		40%			40%		100%		100%		100%	
	REPLACEMENT REQUIRED (Inches)					0		0			-381		0		0		0	
	TOTAL REPLACEMENT REQUIRED (Inches)					-381	A negative value represents a surplus											
	ARE SMALL SPECIES (3" to 5") TREES UTILIZED IN MITIGATION? (Inches)			No		0	MITIGATION PROVIDED AS SMALL SPECIES PRESERVATION											
							MITIGATION PROVIDED AS PROPOSED PLANTINGS (SEE PLANTING PLAN)											
							MITIGATION PROVIDED AS PAYMENT OF $100 PER INCH											
	MITIGATION BALANCE					-381	A negative value represents a surplus											

LEGEND OF ABBREVIATIONS

R	Remove
P	Preserve. Tree to remain that meets root protection zone (RPZ) requirements described in Section 35-532 of the UDC.
E	not counted - in easement
O	not counted - outside of property line
U	not counted - unhealthy
S	not counted - Tree to be preserved, but root protection zone (RPZ) requirement not met

DESCRIPTION OF SPECIES		PROTECTED SIZE (DBH)	MITIGATION RATE
	NO CATEGORY TO FALL BELOW 10% PRESERVATION		
SMALL SPECIES:	Condalia, Blue Wood Condalia, Texas Redbud, Redbud, Texas Mountain Laurel, Persimmon, Texas Persimmon, Hawthorn, Possumhaw, Crabapple, Brazil Tree, Downy Hawthorne. Possumhaw and Crabapple protected within the floodplain only.	5" - 11.99"	1:1
SHORT LIVED SPECIES:	Ashe Juniper, Mesquite, Arizona Ash and Hackberry	10" - 23.99"	1:1
SIGNIFICANT SPECIES:	All other species not listed above	10" - 23.99"	1:1
SIGNIFICANT SHORT LIVED:	See SHORT LIVED SPECIES above	10" - 23.99"	1:1
HERITAGE SMALL SPECIES:	See SMALL SPECIES above	12" +	1:1
HERITAGE:	See SIGNIFICANT SPECIES above	24" +	3:1
HERITAGE SHORT LIVED:	See SHORT LIVED SPECIES above	24" +	1:1
NON NATIVE/ INVASIVE SPECIES:	Non-Native/ Invasive Trees not protected and not included within the survey: Chinese Pistache (Pistacia chinensis), Chinaberry (Melia azedarach), Chinese Tallow (Sapium sebiferum), Tree of Heaven (Ailanthus altissima) and Salt Cedar (Tamarix species)	NOT PROTECTED	

NOTES

As per Toni Villareal on June 15, 2007. Short lived species 2-10" may be included within mitigation. DAS - phone
AS per Jacob Sanchez on Sept 6, 2007 - Crape myrtles may be included in tree preservation and parking lot shading. - DAS PPR for PAC 06042.B

project no. 012372

6-1-12

date 08/01/2012

Frio Bulky Waste Collection Center
City of San Antonio Solid Waste Management Department
Frio City Road, San Antonio, TX 78226

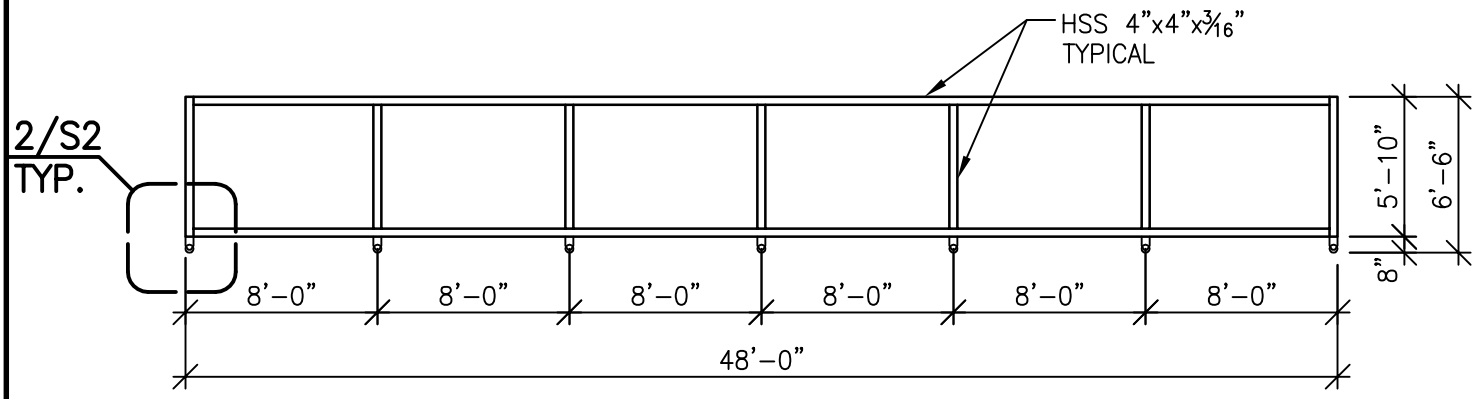
revisions:

RVK
architecture interior design landscape architecture
745 e mulberry ave suite 601
san antonio texas 78212
telephone: 210.733.3535
web: www.rvk-architects.com

construction documents

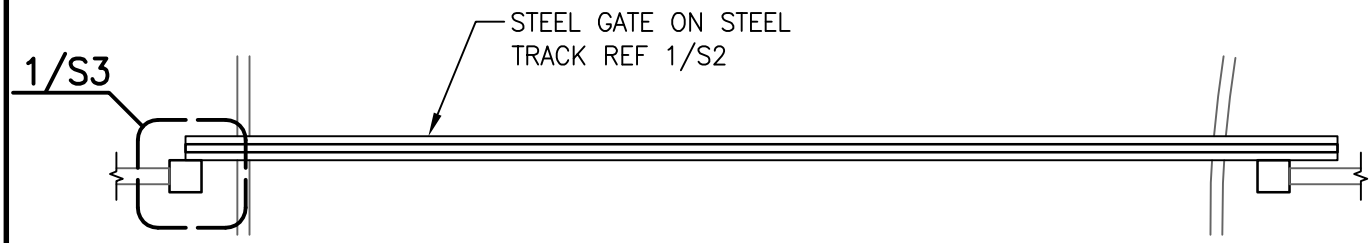
TP-101

TREE PRESERVATION INVENTORY & DETAILS



1 GATE ELEVATION

SCALE : 1/8" = 1'-0"



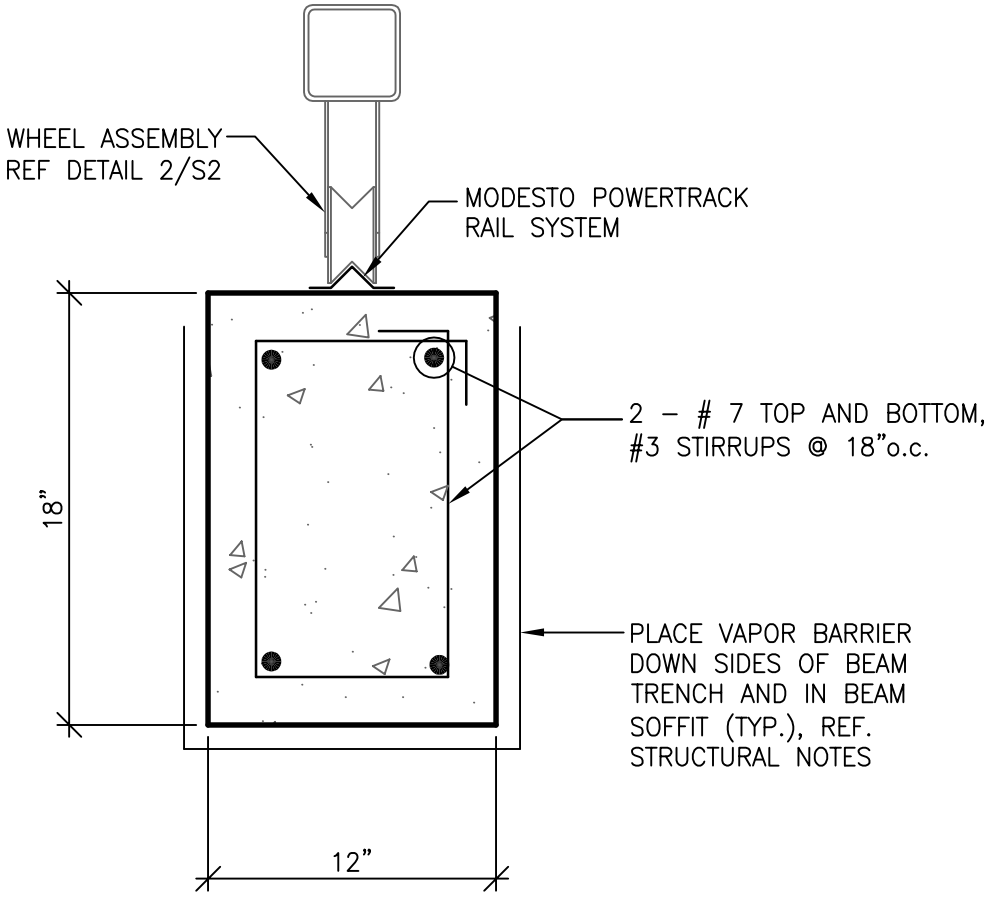
2 GATE PLAN

SCALE : 1/8" = 1'-0"

ALPHA
Consulting Engineers, Inc.
STRUCTURAL ENGINEERS
25836 HWY. 281 N., SUITE 200 SAN ANTONIO, TEXAS 78258
TEL: (210) 227-3647
www.alphaconsultingengineers.com

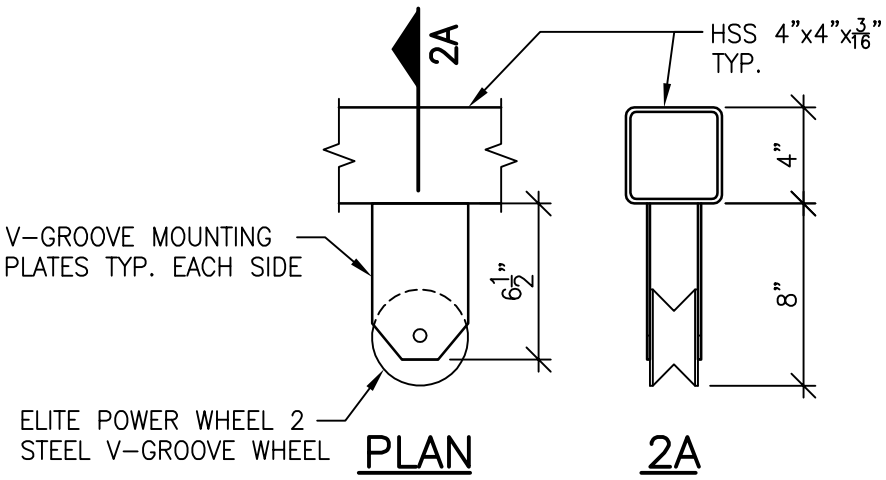
SUBJECT	GATE PLAN AND DETAILS
PROJECT	FRIO BULKY WASTE COLLECTION CENTER
BY	FAL
PROJECT NO.	122140
CHECK	SST
DATE:	05-17-2012

SHEET S1 OF 4



1 SECTION

SCALE : 1 1/2" = 1'–0"



2 WHEEL ASSEMBLY

SCALE : 1 1/2" = 1'–0"

ALPHA
Consulting Engineers, Inc.
STRUCTURAL ENGINEERS
25836 HWY. 281 N., SUITE 200 SAN ANTONIO, TEXAS 78258
TEL: (210) 227-3647
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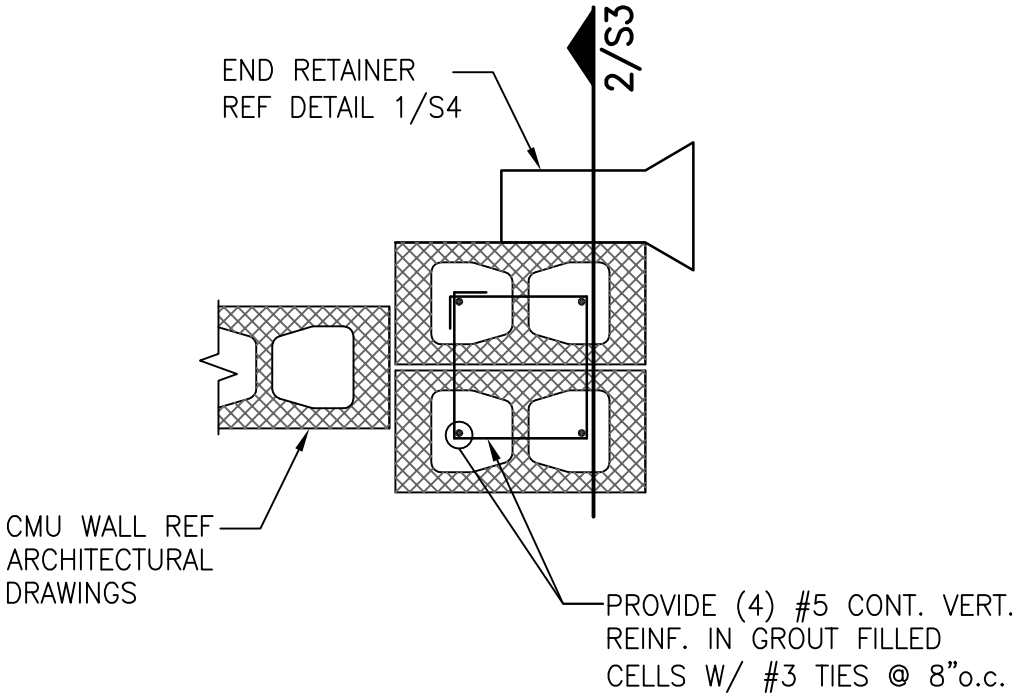
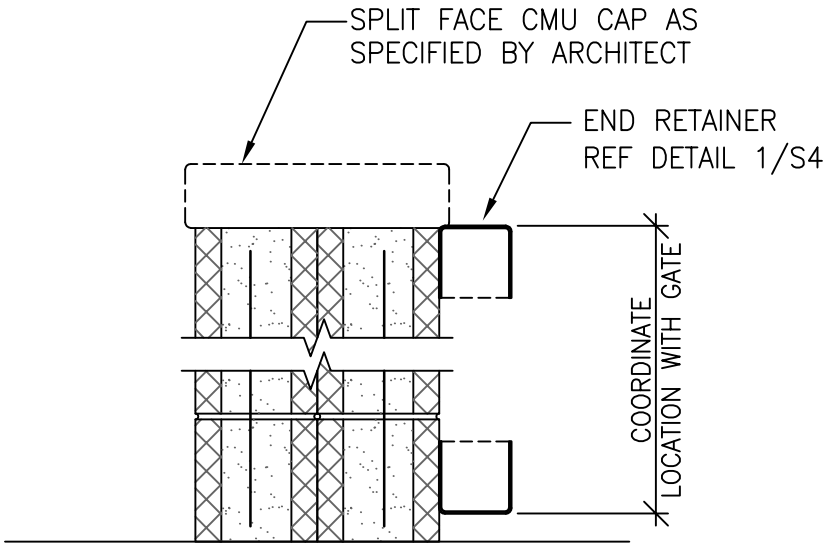
SUBJECT	GATE PLAN AND DETAILS
PROJECT	FRIO BULKY WASTE COLLECTION CENTER
BY	FAL
PROJECT NO.	122140
CHECK	SST
DATE:	05–17–2012

SHEET S2 OF 4



1 SECTION

SCALE : 1" = 1'–0"



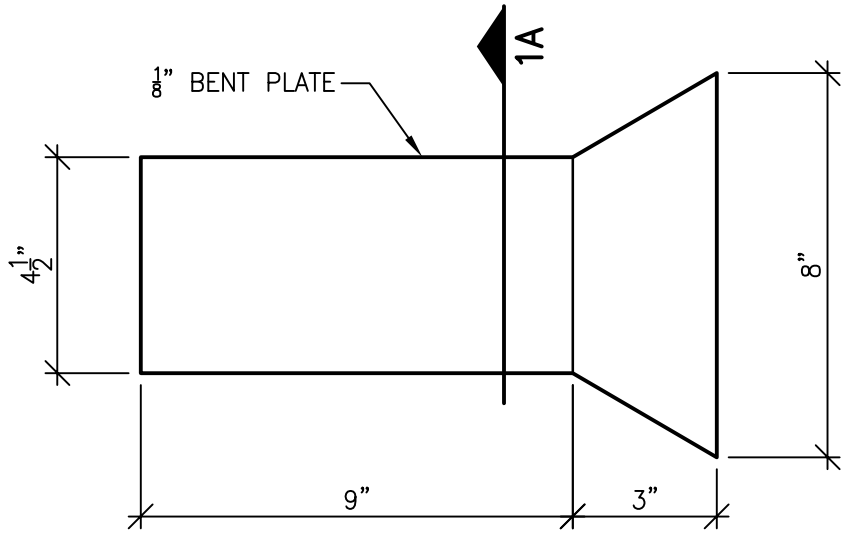
2 SECTION

SCALE : 1" = 1'–0"

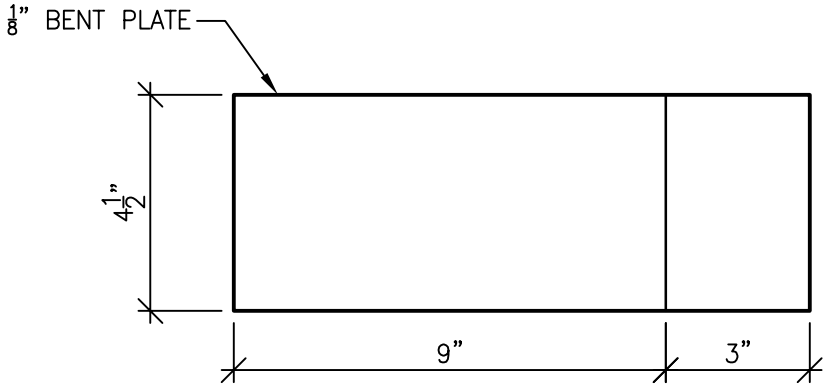
ALPHA
Consulting Engineers, Inc.
STRUCTURAL ENGINEERS
25836 HWY. 281 N., SUITE 200 SAN ANTONIO, TEXAS 78258
TEL: (210) 227-3647
www.alphaconsultingengineers.com

SUBJECT	GATE PLAN AND DETAILS
PROJECT	FRIO BULKY WASTE COLLECTION CENTER
BY	FAL
PROJECT NO.	122140
CHECK	SST
DATE:	05–17–2012

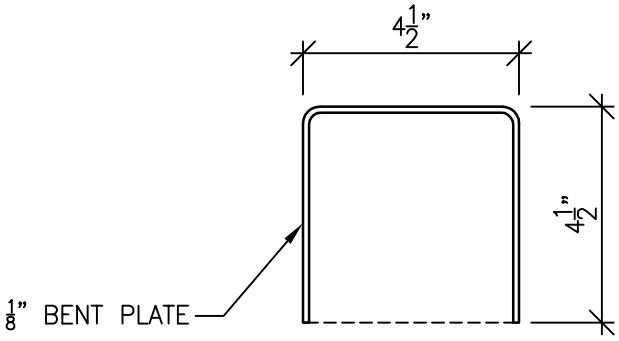
SHEET S3 OF 4



PLAN



ELEVATION



1A

1 END RETAINER

SCALE : 3" = 1'-0"

ALPHA
Consulting Engineers, Inc.
STRUCTURAL ENGINEERS
25836 HWY. 281 N., SUITE 200 SAN ANTONIO, TEXAS 78258
TEL: (210) 227-3647
www.alphaconsultingengineers.com

SUBJECT GATE PLAN AND DETAILS

PROJECT FRIO BULKY WASTE COLLECTION CENTER

BY FAL PROJECT NO. 122140

CHECK SST DATE: 05-17-2012

SHEET S4 OF 4

CITY OF SAN ANTONIO
025 UNIT PRICING FORM

Revised June 1, 2012

ITEM NO.	BID ITEM DESCRIPTION	UNIT OF MEASURE	APPROX. QUANTITIES	UNIT BID PRICE	AMOUNT
	BASE BID				
1	Mobilization	Lump Sum	1		
2	Insurance and Bonding	Lump Sum	1		
3	Silt Fence	Linear Feet	1000		
4	Construction Entrance	Lump Sum	1		
5	Tree Protection (per Addendum)	Lump Sum	1		
6	Demolition	Lump Sum	1		
7	Clearing, Grubbing, and Rough Grading	Lump Sum	1		
8	Retaining Walls	Linear Feet	327		
9	Site Work and Final Subgrade	Lump Sum	1		
10	1.5" Water Line, Complete in Place	Linear Feet	320		
11	6" Sewer Line, Complete in Place	Linear Feet	64		
12	Irrigation System, complete (per Addendum)	Lump Sum	1		
13	Site Electrical Service, complete	Lump Sum	1		
14	Site IT Services, complete	Lump Sum	1		
15	Storm Inlets	Each	3		
16	Storm Pipe 15" Corr HDPE	Linear Feet	364		
17	Storm Pipe 18" RCP	Linear Feet	28		
18	Attendant Station Foundation	Lump Sum	1		
19	Attendant Station Structure	Lump Sum	1		
20	Attendant Station HVAC/Mechanical	Lump Sum	1		
21	Attendant Station HVAC/Mechanical	Lump Sum	1		
22	Attendant Station Electrical	Lump Sum	1		
23	Attendant Station IT Systems	Lump Sum	1		
24	Masonry Walls, Columns, and Signs (per Addendum)	Linear Feet	235		
25	Electric Rolling Gate, complete	Each	1		
26	Wall Lighting (per Addendum)	Each	10		
27	Collection Center Lighting	Each	20		
28	Shade Canopy (14' x 24'), complete	Each	5		

Revised June 1, 2012

ITEM NO.	BID ITEM DESCRIPTION	UNIT OF MEASURE	APPROX. QUANTITIES	UNIT BID PRICE	AMOUNT
29	Concrete Pavement and Base, Complete	Square Yard	7722		
30	Private Curb	Linear Feet	1707		
31	Private Concrete Sidewalk and Flatwork	Square Feet	637		
32	Fencing/Columns (per Addendum)	Linear Feet	1235		
33	30' Manual Double Gate w/Columns (per Addendum)	Each	1		
34	Pavement Striping	Lump Sum	1		
35	Traffic Signs	Lump Sum	1		
36	Curb Stops	Each	21		
37	Retaining Wall Guardrail and Accessories	Lump Sum	1		
38	Public Curbs	Linear Feet	320		
39	Public Sidewalks	Square Feet	2040		
40	Landscaping (per Addendum)	Lump Sum	1		
	The Bidder assumes all responsibility for all calculations on this form or file. The Bidder shall check all calculations contained in the file and make any necessary modifications, deletions, or additions.			**TOTAL BASE BID AMOUNT**	
	ADDITIVE ALTERNATE #1				
41	Mobilization	Lump Sum	1		
42	Insurance and Bonding	Lump Sum	1		
43	Silt Fence	Linear Feet	440		
44	Construction Entrance	Lump Sum	1		
45	Demolition	Lump Sum	1		
46	Clearing, Grubbing, and Rough Grading	Lump Sum	1		
47	Site Work and Final Subgrade	Lump Sum	1		
48	Irrigation System, complete	Lump Sum	1		
49	Site Electrical Service, complete	Lump Sum	1		
50	Site Lighting	Each	6		
51	Concrete Pavement and Base, Complete	Square Yard	2827		
52	Private Curb	Linear Feet	615		
53	Fencing (per Addendum)	Linear Feet	700		

Revised June 1, 2012

ITEM NO.	BID ITEM DESCRIPTION	UNIT OF MEASURE	APPROX. QUANTITIES	UNIT BID PRICE	AMOUNT
54	Manual Double Gate (per Addendum)	Each	1		
55	Public Curbs	Linear Feet	330		
56	Public Sidewalks	Square Feet	2312		
57	Landscaping (per Addendum)	Lump Sum	1		
	The Bidder assumes all responsibility for all calculations on this form or file. The Bidder shall check all calculations contained in the file and make any necessary modifications, deletions, or additions.		**TOTAL ALTERNATE NO. 1 AMOUNT**		

_____ hereby certifies that the unit prices shown on this complete computer print-out for all of the bid items and the alternates contained in this proposal are the unit prices intended and that its bid will be tabulated using these unit prices and no other information from this print-out.

_____ Acknowledged and agrees that the total bid amount shown will be read as its total bid and further agrees that the official total bid amount will be determined by multiplying the unit bid prices shown in this print-out by the respective estimated quantities shown in the proposal and then totaling all of the extended amounts.

_____ agrees to the terms, conditions, and requirements of the bidder's bid proposal.

Signed: _____ Date: _____

Title: _____

General Decision Number: TX120016 01/06/2012 TX16

Superseded General Decision Number: TX20100017

State: Texas

Construction Types: Heavy and Highway

Counties: Atascosa, Bandera, Bastrop, Bell, Bexar, Brazos, Burleson, Caldwell, Comal, Coryell, Guadalupe, Hays, Kendall, Lampasas, McLennan, Medina, Robertson, Travis, Williamson and Wilson Counties in Texas.

HEAVY (excluding tunnels and dams, not to be used for work on Sewage or Water Treatment Plants or Lift / Pump Stations in Bell, Coryell, McClennon and Williamson Counties) and HIGHWAY Construction Projects

Modification Number	Publication Date
0	01/06/2012

* SUTX2011-006 08/03/2011

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER (Paving and Structures)	$ 12.56	
ELECTRICIAN	$ 26.35	
FORM BUILDER/FORM SETTER		
Paving & Curb	$ 12.94	
Structures	$ 12.87	
LABORER		
Asphalt Raker	$ 12.12	
Flagger	$ 9.45	
Laborer, Common	$ 10.50	
Laborer, Utility	$ 12.27	
Pipelayer	$ 12.79	
Work Zone Barricade Servicer	$ 11.85	
PAINTER (Structures)	$ 18.34	
POWER EQUIPMENT OPERATOR:		
Agricultural Tractor	$ 12.69	
Asphalt Distributor	$ 15.55	
Asphalt Paving Machine	$ 14.36	
Boom Truck	$ 18.36	
Broom or Sweeper	$ 11.04	
Concrete Pavement Finishing Machine	$ 15.48	
Crane, Hydraulic 80 tons or less	$ 18.36	
Crane, Lattice Boom 80 tons or less	$ 15.87	

Crane, Lattice Boom over 80 tons.....$ 19.38
Crawler Tractor.....$ 15.67
Directional Drilling Locator.....$ 11.67
Directional Drilling Operator.....$ 17.24
Excavator 50,000 lbs or Less.....$ 12.88
Excavator over 50,000 lbs...$ 17.71
Foundation Drill, Truck Mounted.....$ 16.93
Front End Loader, 3 CY or Less.....$ 13.04
Front End Loader, Over 3 CY.$ 13.21
Loader/Backhoe.....$ 14.12
Mechanic.....$ 17.10
Milling Machine.....$ 14.18
Motor Grader, Fine Grade....$ 18.51
Motor Grader, Rough.....$ 14.63
Pavement Marking Machine....$ 19.17
Reclaimer/Pulverizer.....$ 12.88
Roller, Asphalt.....$ 12.78
Roller, Other.....$ 10.50
Scraper.....$ 12.27
Spreader Box.....$ 14.04
Trenching Machine, Heavy....$ 18.48

Servicer.....$ 14.51

Steel Worker
Reinforcing.....$ 14.00
Structural.....$ 19.29

TRAFFIC SIGNAL INSTALLER
Traffic Signal/Light Pole Worker.....$ 16.00

TRUCK DRIVER
Lowboy-Float.....$ 15.66
Off Road Hauler.....$ 11.88
Single Axle.....$ 11.79
Single or Tandem Axle Dump Truck.....$ 11.68
Tandem Axle Tractor w/Semi Trailer.....$ 12.81

WELDER.....$ 15.97

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

==========

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rate.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter

* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
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The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

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END OF GENERAL DECISION

General Decision Number: TX120002 04/20/2012 TX2

Superseded General Decision Number: TX20100003

State: Texas

Construction Type: Building

County: Bexar County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes and apartments up to and including 4 stories). (Use current heavy & highway general wage determination for Paving & Utilities Incidental to Building Construction).

Modification Number	Publication Date
0	01/06/2012
1	04/20/2012

* ASBE0087-001 01/01/2011

	Rates	Fringes
Asbestos/Insulator Worker (Includes application of all insulating materials, protective coverings, coatings, and finishings to all types of mechanical systems.)	$ 21.67	7.77

BRTX0001-004 05/01/2011

	Rates	Fringes
BRICKLAYER	$ 24.67	9.02

ELEC0060-001 06/01/2010

	Rates	Fringes
CABLE SPLICER	$ 25.20	3.75+12%
ELECTRICIAN	$ 24.95	3.75+12%

ELEC0060-002 06/01/2009

	Rates	Fringes
ELECTRICIAN (Low Voltage including pulling & installing cable through conduit)	$ 19.51	8%+4.92

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* ELEV0081-001 01/01/2012

	Rates	Fringes
Elevator Constructor MECHANIC	$ 35.75	23.535

FOOTNOTE; A. 6% under 5 years based on regular hourly rate for all hours worked. 8% over 5 years based on regular hourly rate for all hours worked.

New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, Christmas Day, and Veterans Day.

ENGI0450-001 07/01/2009

	Rates	Fringes
Power equipment operators:		
Cranes	$ 29.75	8.75

IRON0066-001 06/01/2009

	Rates	Fringes
IRONWORKER (Excluding metal building erectors)		
Structural	$ 18.50	5.15

MARB0002-001 07/01/2005

	Rates	Fringes
TILE SETTER	$ 18.50	6.10

PLUM0142-001 07/01/2011

	Rates	Fringes
Plumbers and Pipefitters (Including HVAC WORK)	$ 29.78	9.10

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* SFTX0669-001 04/01/2012

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers)	$ 25.84	16.47

SHEE0067-001 04/01/2009

	Rates	Fringes
Sheet metal worker (Including HVAC Duct Work)	$ 25.18	10.75

SUTX1988-002 11/01/1988

	Rates	Fringes
Acoustical Ceiling Installer	$ 12.26	
CARPENTER (Excluding Acoustical Ceiling Installer & Drywall Hanger)	$ 10.64	

CEMENT MASON/CONCRETE FINISHER...$ 11.46

DRYWALL HANGER.....$ 11.88

GLAZIER.....$ 10.78 1.40

IRONWORKER (Excluding Metal
Building Assemblers)
Reinforcing.....$ 10.19 3.57

Laborers:
Mason Tenders.....$ 8.36 1.78
Mortar Mixers.....$ 8.99
PLASTERER'S TENDERS.....$ 8.68
Unskilled.....$ 7.25

LATHER.....$ 15.25

PAINTER (Excluding
Tapers/Finishers).....$ 8.01

PLASTERER.....$ 15.25

Power equipment operators:
Front End Loader.....$ 7.36

Roofers:
Kettlemen.....$ 8.85
Roofers.....$ 8.14
Waterproofers.....$ 7.25

Sheet Metal Worker
Other Work.....$ 11.62

Taper/Finisher.....$ 7.99

TRUCK DRIVER.....$ 7.25

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification
and wage rates that have been found to be prevailing for the
cited type(s) of construction in the area covered by the wage
determination. The classifications are listed in alphabetical
order of "identifiers" that indicate whether the particular

rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

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END OF GENERAL DECISION

LANDSCAPE SPECIFICATIONS
FRIO BULKY WASTE COLLECTION CENTER

TABLE OF CONTENTS

SECTION 03 3000

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Slabs on grade.

C. Concrete footings.

D. Concrete curb wall and retaining wall.

E. Concrete reinforcement.

F. Joint devices associated with concrete work.

G. Concrete finish.

H. Abrasive blast finish.

I. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 02751 - Portland Cement Concrete Paving: Sidewalks.

1.03 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; American Concrete Institute International; 2010.

B. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.

C. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.

D. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2009b.

F. ASTM C33 - Standard Specification for Concrete Aggregates; 2011.

G. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2010.

H. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2011.

I. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2010a.

J. ASTM C150 - Standard Specification for Portland Cement; 2011.

K. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2010b.

L. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.

M. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2007.

N. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2010a.

O. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2010.

P. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 1999 (Reapproved 2008).

Q. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2011.

R. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type); 1998 (Reapproved 2010).

S. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2008).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Acquire cement from same source and aggregate from same source for entire project.

C. Follow recommendations of ACI 305R when concreting during hot weather.

D. Follow recommendations of ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 FORMWORK

A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 REINFORCEMENT

A. ASTM A 615/A 615M Grade 60 (420).

B. Joint Dowel Bars:
   1. Plain steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.

C. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gage.
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C 150, Type I - Normal Portland type .
   1. Acquire all cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C 33.

C. Water: Clean and not detrimental to concrete.

2.04 ACCESSORY MATERIALS

A. Reglets: Formed steel sheet, galvanized, with temporary filler to prevent concrete intrusion during placement.

B. Bonding Agent: ASTM C 1059, Type II acrylic non-redispersable type.

C. Epoxy Bonding System: ASTM C 881, type as required by project conditions.

D. Non-Shrink Cementitious Grout: ASTM C1107/C1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Minimum Compressive Strength at 48 Hours: 2,400 psi.
   2. Minimum Compressive Strength at 28 Days: 7,000 psi.

E. Bonding Agent (for use in cement parge coat: Acrylic Emulsion type; Acrylic manufactured by Thoro Systems.

2.05 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Normal Weight Concrete:

1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 3,000 psi.

2.06 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Verify that forms are clean and free of rust before applying release agent.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

E. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Notify Landscape Architect not less than 24 hours prior to commencement of placement operations.

3.05 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch; 1/16 inch or more in height. Provide finish as follows:
   1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

D. Exposed Aggregate Finish:
   1. Sand blast concrete finish to surfaces where indicated shall be light abrasive blast to expose fine aggregate with exposure of course aggregate (maximum 1/16" reveal).
      a. Sand blasting shall not affect the color of the finished surface.
   2. Prepare a mock-up of no less than 10 square feet separate from the proposed work.
   3. Abrasive shall be graded blasting sand or abrasive and shall be of gradation, size and sharpness to produce an acceptable finish on the field condition mock-up.
   4. Contractor shall have on hand for the blasting of the mock-up, several various abrasives, which shall include sharp type abrasive of medium and fine gradation.
   5. Apply finish in presence of the Owner and Landscape Architect. Receive approval prior to applying finish to any concrete work. Maintain continuity of finish throughout the job.

6. Perform abrasive blasting after not less than seven (7) days of curing and before 30 days of curing time has elapsed.
    a. Ensure the surfaces to be blast finished are blasted at the same age for uniform results.
    b. Blast prior to sealing joints.
7. Protect adjacent materials during blasting operations. Maintain control of concrete chips, dust and debris.
    a. Clean up and remove such material at completion of each day of operation.
    b. Prevent migration of airborne materials with containing devices.

3.06 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
    1. Normal concrete: Not less than 7 days.
    2. High early strength concrete: Not less than 4 days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:
    1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
    2. Final Curing: Begin after initial curing but before surface is dry.
        a. Moisture-retaining cover: Seal in place with waterproof tape or adhesive.
        b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.07 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design to testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

E. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 75 cu yd or less of concrete placed.

F. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.08 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by the Landscape Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete surfaces except upon express direction of Landscape Architect for each individual area.

END OF SECTION

SECTION 04 2000

UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete Block.

B. Mortar and Grout.

C. Reinforcement and Anchorage.

D. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 1900 - Water Repellents: Anti-graffiti coating.

1.03 REFERENCE STANDARDS

A. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

C. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2009b.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2010.

E. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2011.

F. ASTM C91 - Standard Specification for Masonry Cement; 2005.

G. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2006.

H. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2010.

I. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2008) .

J. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2010.

K. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength; 2009.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

1.05 QUALITY ASSURANCE

A. Installers:

1. Minimum 5 years documented experience with projects of similar complexity.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:

1. Size: Standard units with nominal face dimensions as indicated on the drawings and nominal depths as indicated on the drawings for specific locations.

2. Load-Bearing Units: ASTM C90, normal weight.
    a. Both hollow and solid block, as indicated.
    b. Exposed faces: Special color and texture, as follows: Split Face.
3. Units with Integral Water Repellent: Concrete block units as specified in this section with polymeric liquid admixture added to concrete masonry units at the time of manufacture.
    a. Performance of Units with Integral Water Repellent:
        1) Water Permeance: When tested per ASTM E514 and for a minimum of 72 hours.
            (a) No water visible on back of wall above flashing at the end of 24 hours.
            (b) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
            (c) No more than 25% of wall area above flashing visibly damp at end of test.
        2) Flexural Bond Strength: ASTM C1357; minimum 10% increase.
        3) Compressive Strength: ASTM C1314; maximum 5% decrease.
        4) Drying Shrinkage: ASTM C1148; maximum 5% increase in shrinkage.
    b. Use only in combination with mortar and grout that also has integral water repellent admixture.

2.02 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150, Type I; color as required to produce approved color sample.
    1. Not more than 0.60 percent alkali.
    2. Hydrated Lime: ASTM C207, Type S.
    3. Mortar Aggregate: ASTM C144.
    4. Grout Aggregate: ASTM C404.

B. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979.

C. Water: Clean and potable.

2.03 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: ASTM A615/A615M Grade 60 (420) deformed billet bars; uncoated.

B. Single Wythe Joint Reinforcement: Ladder type; ASTM A82/A82M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M, Class B; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.

2.04 ACCESSORIES

A. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.05 MORTAR AND GROUT MIXES

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
    1. Exterior, non-loadbearing masonry: Type N.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Landscape Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Grout: ASTM C476. Consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

3.03 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.
   3. Mortar Joints: Flush.

3.04 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Remove excess mortar and mortar smears as work progresses.

D. Interlock intersections and external corners.

E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

G. Cut mortar joints flush.

3.05 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

A. Install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

E. Reinforce joint corners and intersections with strap anchors 16 inches on center.

3.06 GROUTED COMPONENTS

A. Reinforce bond beams with 2, No. 5 bars, 1 inch from bottom web.

B. Reinforce columns with 4, No. 5 bars, placed 8 inches on center.

C. Lap splices minimum 24 bar diameters.

D. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

E. Place and consolidate grout fill without displacing reinforcing.

F. At bearing locations, fill masonry cores with grout for a minimum 16 inches either side of opening.

3.07 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control joints.

B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.

C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

D. Form expansion joint as detailed.

3.08 TOLERANCES

A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

E. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

F. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.09 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.10 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 07 1900
WATER REPELLENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water repellents and graffiti control applied to exterior split faced masonry surfaces.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product description.

1.04 FIELD CONDITIONS

A. Do not apply water repellent when ambient temperature is lower than 50 degrees F or higher than 100 degrees F.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Silane/Siloxane Water Repellents:
   1. PROSOCO, Inc; Product Blok-Guard & Graffiti Control: www.prosoco.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Water Repellent: Non-glossy, colorless, penetrating, water-vapor-permeable, non-yellowing sealer, that dries invisibly leaving appearance of substrate unchanged.
   1. Applications: Vertical surfaces only.
   2. Number of Coats: Two.
   3. Products: Solvent-based silicone blend to weatherproof concrete block and resist penetration of grafitti.
      a. PROSOCO, Inc.; Blok-Guard and Grafitti Control
      b. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify joint sealants are installed and cured.

B. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of water repellent.

3.02 PREPARATION

A. Protection of Adjacent Work:
   1. Protect adjacent landscaping, property, and vehicles from drips and overspray.
   2. Protect adjacent surfaces not intended to receive water repellent.

B. Prepare surfaces to be coated as recommended by water repellent manufacturer for best results.

C. Remove loose particles and foreign matter.

D. Allow surfaces to dry completely to degree recommended by water repellent manufacturer before starting coating work.

3.03 APPLICATION

A. Apply water repellent in accordance with manufacturer's instructions, using procedures and application methods recommended as producing the best results.

B. Apply two coats, minimum.

C. Remove water repellent from unintended surfaces immediately by a method instructed by water repellent manufacturer.

END OF SECTION

SECTION 31 1330

TREATMENT OF EXISTING TREES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Operations in connection with protection, mulching, pruning, feeding of existing trees.
   1. Refer to Section 015639 - Landscape Protection concerning installation of tree protection barricade fence and tree armor.

1.02 RELATED REQUIREMENTS

A. Section 01330 - Administrative Requirements: Shop Drawings, Product Data and Samples

B. Site Clearing - Refer to Civil.

C.

D. Section 32 84 42 - Landscape Irrigation System

E. Section 32 91 13 - Soil Preparation

F. Section 32 92 23 - Sodding

G. Section 32 92 19 - Seeding

H. Section 32 93 00 - Exterior Plants

I. Section 32 93 10 - Landscape Maintenance

1.03 REFERENCE STANDARDS

A. The most current edition of the publications listed below form a part of this specification to the extent referenced. The following publications by the American National Standards Institute (ANSI) are referred to in the text by the basic designation only.
   1. ANSI Z60.1Nursery Stock.
   2. ANSI Z133.1Tree Care Operations- Pruning, Trimming, Repairing, Maintaining, and Removing Trees and Cutting Brush.
   3. ANSI A300Tree, Shrub and Other Woody Plant Maintenance- Standard Practices.

1.04 SITE CONDITIONS

A. Inspection:
   1. After layout of the improvements is accomplished, Contractor and Arborist shall review impact of new construction and need for compensatory pruning.
   2. Report to Landscape Architect / Owner's Representative the extent of pruning and treatments required prior to initiating any work.
   3. Contractor, Arborist, Owner and Landscape Architect shall review pruning work and treatments to be completed a minimum one (1) week prior to initiating work.

1.05 QUALITY CONTROL

A. Employ qualified Arborist approved by the Landscape Architect. Arborist shall have, at a minimum, the following qualifications:
   1. Three (3) years documented experience.
   2. Three (3) year period Tree Maintenence License (TRM) as regulated by the City of San Antonio Department of Development Services, Tree and Landscape Section.
   3. Certified Landscape Professional Contractor (CLPC) as administered by the Texas Nursery and Landscape Association (TNLA) or college degree relating to the landscape industry.
   4. Membership in:
      a. TCIA - Tree Care Industry Association
      b. ISA - International Society of Arborists
   5. Meet contract requirements for insurance.
      a. Maintain liability insurance in the amount of $1,000,000 or more.
   6. Licensed for application and use of pesticides.

7. Bonded.

1.06 SCOPE

A. Services of the Arborist shall include:
   1. Survey the condition of existing trees and other landscape vegetation at the site indicated to remain.
      a. Before mobilization at the site, document condition of landscape vegetation with photographs which include readily identifiable objects which indicate the size of the plant in height and width of canopy.
   2. Provide appraisal of existing trees:
      a. Appraise the value of all significant trees to be preserved.
      b. The Landscape Architect shall determine which trees are significant.
      c. The Arborist shall appraise the tree/s using the Guidelines of the Council of Tree and Landscape Appraisers Guide for Plant Appraisal, 9th Edition, Trunk Formula Method.
      d. Provide and hang a 18" x 24" sign on the protective fencing (or at location directed by Landscape Architect) stating the appraised value of the tree to be preserved. Refer to detail of sign on the tree preservation plan.
      e. Pending fee is assessed for payment to Owner, fee will be adjusted based on mitigation penalty as defined by the City of San Antonio Tree preservation Ordinance.
   3. Inspection of all existing trees scheduled for preservation in order to determine:
      a. Initial overall health of the tree.
      b. A Scheduled Prescription of Treatment for all preserved trees [within 100 feet of new improvements/construction activities].
         1) The Arborist of Record shall meet with the Contractor and Landscape Architect on the project site to review all construction activity within protection zones (RPZ's) and within an area twenty-five (25) feet outside of the RPZ's of all trees scheduled for preservation.
         2) The arborist shall be made aware of all construction activity, including proposed hardscape, utility, and site irrigation activity within the area aforementioned.
         3) Arborist shall also be made aware of any public right of way and/or intersection clear vision requirements/concerns.
         4) The outcome of this meeting is to be a written document - Prescription of Treatment For Preserved Trees. This document shall prescribe treatment measures beyond requirements already specified in this Section for said trees during preconstruction, construction and post construction time periods.
   4. Pruning and feeding of trees.
   5. Monitoring construction activities impacting trees.
      a. Inspect landscape protection barriers before commencement of demolition and excavation activities.
         1) Observe excavation in the vicinity of existing trees from commencement until conclusion.
         2) Direct excavation which occurs near major root systems.
         3) Direct installation of temporary tree vent systems as required to ensure vigor and good health of trees.
         4) Prescribe additional measures or protection required to provide optimal growth conditions at the construction site.
   6. Periodically inspect the construction site for possibly dangerous or damaging practices, in relation to the existing trees, occurring or developing at the site.
      a. Inform Contractor of such conditions and develop plan to repair damage that has occurred and prevent further damage.
      b. Complete all repairs.

1.07 SUBMITTALS

A. Furnish at Landscape Architect's office, prior to installation, the following:
   1. Qualifications: Arborist's name, company and qualifications.

2. Mulch: Label from bag (Supplier's statement of analysis if bulk), and 1-gallon container of mulch sample.
3. Fertilizer: Label from bag or Supplier's brochure.
4. Treatment Report: General schedule of Arborist's pruning and treatment services.

B. Furnish at Landscape Architect's office, prior to close-out of Project, the following:
1. Proof of Compliance with Specifications
a. Demonstrate compliance by providing invoices to prove purchase of all products in sufficient quantity to cover the project at the rates recommended by the manufacturer or as specified. Include project name, date of purchase of product and name of contact.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Fertilizer:
1. Mycor Plant Saver 4-7-4; www.planthealthcare.com; John Deere Landscapes, San Antonio, Texas; (210)656-8100.

B. Tree Barricade Fencing: Refer to Section 015639 - LANDSCAPE PROTECTION.

C. Tree Armor: Refer to Section 015639 - LANDSCAPE PROTECTION.

D. Mulch:
1. Regular single shredded, unscreened hardwood or approved equal.

E. Tree Wound Paint: Black enamel based spray paint or asphaltic based tree paint such as Treeheal or Ortho.

PART 3 - EXECUTION

3.01 PROTECTION FOR EXISTING TREES TO BE PRESERVED

A. Coordination with drawings:
1. Trees to be preserved are represented by a solid line.
2. Trees to be removed are represented by a dashed or ghosted line.
3. Trees to be planted are graphically differentiated from existing trees.

B. All trees to be preserved on the property shall be protected against damage from construction operations.
1. Tree protection fencing and armor protection must be in-place and approved prior to beginning any clearing, demolition or construction activity; coordinate with Section 015639-LANDSCAPE PROTECTION.
2. Only those trees located within the limits of improvements to be constructed, or as indicated, are to be removed.
3. All trees to remain shall be flagged for review after the location of improvements to be constructed are staked in the field.
4. Any tree to be removed shall be reviewed by the Landscape Architect and Owner for approval prior to removal.

C. All tree protection shall be installed by Contractor and approved by City of San Antonio (COSA) tree and landscape inspector prior to initiation of clearing operation. Contractor is responsible to request COSA inspection.

D. Protect all trees/vegetation that are to remain from the following:
1. Compaction of root area by equipment or material storage; construction materials shall not be stored closer to trees than the farthest extension of their limbs (dripline).
2. The proposed finished grade within the root protection zone of any preserved tree shall not be raised or lowered more than three (3) inches.
3. Trunk damage by moving equipment, material storage, nailing or bolting.
4. Strangling by tying ropes or guy wires to trunks or large branches.
5. Poisoning by pouring solvents, gas, paint, etc., on or around trees and roots.
6. Cutting on roots by excavating, ditching, etc.

7. Damage of branches by improper pruning.
8. Drought from failure to water or by cutting or changing normal drainage pattern past roots. Contractor shall provide means as necessary to ensure positive drainage.
9. Changes of soil pH factor by disposal of lime base materials such as concrete, plaster, lime treatment at pavement subgrade, etc.
    a. When installing concrete adjacent to the root zone of a tree, use a minimum 6 mil. plastic vapor barrier behind the concrete to prohibit leaching of lime into the soil.
10. Protect all existing trees near areas to be stabilized from underground contaminations:
    a. Place a 6 mil. Plastic film barrier along exposed vertical cut extending a minimum 12" into undisturbed subgrade below depth of stabilization.
11. No vehicular traffic shall occur within the drip line of any tree.
12. No soil shall be spread, spoiled or otherwise disposed of under any tree within the drip line.

E. Any damage done to existing tree crowns or root systems shall be repaired by the Arborist to the satisfaction of the Landscape Architect and Owner.
    1. Broken branches shall be cut cleanly.
    2. Any roots cut shall be cut cleanly with a saw other means approved by the Landscape Architect.

F. Repairs to the trees necessitated by damage caused through negligence of Contractor or his employees will be completed at the Contractor's expense.
    1. When trees other than those approved for removal are destroyed or killed, or badly damaged as a result of construction operations, the contract sum will be reduced by the value of the tree as determined by using the accepted International Society of Arboriculture's formula.
    2. Fee assessed shall be adjusted based on mitigation penalty as defined by the City of San Antonio Tree Preservation Ordinances.

3.02 ROOT PROTECTION ZONE

A. The root protection zone (RPZ) is measured with a radius from the trunk of 1 foot for each caliper inch of trunk measured at four and one-half (4-1/2') feet above grade or at the point where the smallest diameter closest to the branching occurs.
    1. No disturbance shall occur closer to the tree than one-half the radius of the RPZ or within five (5) feet of the tree whichever is greater for trees 10 inch caliper or less.

3.03 ROOT PROTECTION ZONE IMPACTS

A. Those trees to remain which have some encroachment on their root protection zone shall have the following maximum allowable impacts:
    1. Minimum Protection Criteria 'A': No disturbance of natural grade, e.g. trenching or excavation, can occur closer to the tree than one-half the radius of the RPZ or within five (5) feet of the tree whichever is greater in no more than 30 percent of the area of the RPZ.
    2. Minimum Protection Criteria 'B': No cut or fill greater than three (3) inches will be located closer to the tree trunk than ½ the RPZ radius distance.
        a. Retaining methods can be used to protect and/or provide lateral support to the area outside the root protection zone.

B. Trees impacted shall have a minimum of a [six (6) inch/four (4) inch layer] of mulch placed and maintained over the root protection zone and the undisturbed area within the dripline.
    1. Immediate pruning and fertilization shall occur per the pruning and fertilization sections of this specification.
    2. Provide water in a slow drip manner to impacted trees as approved by the Landscape Architect and Owner.
        a. Coordinate with Section 01 5639- LANDSCAPE PROTECTION.
    3. Spray tree crowns periodically to reduce dust accumulation on the leaves.

3.04 INSTALLATION OF UTILITIES

A. Installation of utility piping, electrical conduit and irrigation piping.

B. All trenching within the drip line of trees shall be done by hand.

C. Hand excavate to minimize damage to root systems as directed by Arborist:
   1. Do not cut roots 1" in diameter or over without approval of [Arborist, Landscape Architect].

3.05 EXCAVATING ADJACENT TREES

A. Excavate within the dripline of trees only where required and when absolutely necessary.
   1. Any excavation within the dripline of trees shall be under the direction of the Arborist.
      a. Arborist shall be at site at all times while excavation is occurring within the dripline. Refer to ROOT PROTECTION ZONE.
   2. Prior to excavation within the tree driplines or the removal of trees adjacent to other trees that are to remain, make a clean cut between the disturbed and undisturbed root zones with a rock saw or similar equipment to minimize root damage of trees remaining in place.
   3. Complete an initial cut for an excavation or trench when located within the dripline of existing tree with rockwheel trencher at the side of the excavation or trench in the direction towards the tree trunk.
      a. Cut to a minimum depth of 30 inches.

B. Where existing grade at tree is to be above new finish grade:
   1. Carefully excavate within the dripline to the new finish grade.
   2. Complete initial cut within the dripline of existing tree with rockwheel trencher to to cleanly sever portion of root system being removed with excavation.
      a. Cut to a minimum depth of 30 inches
   3. Prune and treat the cut roots as specified.
   4. Keep the exposed roots damp across face of cut subgrade.
   5. Temporarily support and protect roots immediately after cut in grade against damage until permanently covered with recommended landscape material or new improvements.
      a. Retain exposed grade with placement of sand bags; refer to detail on tree preservation plan.
      b. Maintain sand bags in place until initiation of formwork installation for permanent improvement/structure.
      c. Pending limit of excavation allows in consideration of cut distance from trunk of tree and RPZ requirements, sand bags may be left in place with the construction of new improvements, e.g. retaining wall (confirm with Structural Engineer if sand bags can serve as the form for the inside face of the wall).
   6. Work includes protection and treatment of roots from trees on adjacent property (trees off-site along property line).

C. Cleanly cut all exposed roots and broken branches one (1) inch in diameter or greater.
   1. In the case of oak species, in order to prevent infection by oak wilt spores, wounds must be painted with an acceptable wound dressing within thirty (30) minutes.
   2. Use pruning saw, loppers or sharp ax as appropriate to cut roots approximately three (3) inches back from new construction.

3.06 PRUNING

A. Governing Standards:
   1. Work procedures will be guided by the current provisions found in the ANSI references listed. The two basic objectives of the pruning operation shall include:
      a. Hazard Reduction Pruning: Completed to remove visible hazards in a tree. Consists of one or more of the maintenance pruning types.
      b. Maintenance Pruning: Completed to maintain and improve tree health and structure; includes hazard reduction pruning.

B. Provide pruning of existing trees:
   1. Refer to PRUNING SCHEDULE for specifics regarding pruning requirements.
   2. At trees which new improvements, including grading/earthwork, encroach within in area demarcated by dripline of tree.
   3. At trees where the removal of limbs and branches is needed to provide clearance for work or to repair damage to trees.

4. At trees to improve overall natural character and openness of the canopies.
5. Removal of dead and broken branches, correction of structural defects:
    a. Remove diseased wood, or structurally weak limbs that may cause a safety hazard.
6. Remove branches that extend over buildings endangering roofs (e.g. branches rubbing against or touching roof).
7. Remove branches in front of windows and which obstruct traffic signs or street intersections.
8. Provide clearance for emergency vehicles, buses, moving vans and similar vehicles along the streets.
9. Prune trees according to their natural growth characteristics leaving trees well shaped and balanced.
10. Provide clearance to allow sight distance/visual access within clear vision areas of street and driveway intersections as required by City of San Antonio Unified Development Code.
    a. Contractor is responsible for contacting Leonard Pruett (210)207-7743 of the City of San Antonio Public Works Department for delineation of clear vision area prior to pruning.
11. Pruning shall be completed to the satisfaction of the Owner and Landscape Architect.

3.07 MAINTENANCE PRUNING TYPES

A. Both hazard reduction pruning and maintenance pruning shall consist of one or more of the following pruning types:
    1. Crown Cleaning: Crown cleaning shall consist of the selective removal of one or more of the following items: dead, dying, or diseased branches, weak branches, water sprouts and stubbed branches.
    2. Crown Thinning: Crown thinning shall consist of the selective removal of branches to increase light penetration, air movement, and reduce weight.
    3. Crown Raising:
        a. Crown raising shall consist of the removal of the lower branches of a tree to provide clearance for vehicles at drives/streets and parking areas to clear height of 13' - 6".
        b. Crown raising shall consist of the removal of the lower branches of a tree to provide clearance for pedestrians along walkways to clear height of 8' - 6".
    4. Crown Reduction, or Crown Shaping: Crown reduction shall consist of decreasing the height and/or spread of a tree.
    5. Vista Pruning: Vista pruning shall consist of selective thinning of framework limbs or specific areas of the crown.
    6. Crown Restoration: Crown restoration pruning shall improve the structure, form and appearance of a tree which has been severely headed, vandalized, storm damaged or improperly pruned.

3.08 UTILITY PRUNING

A. Utility pruning shall consist of one or more of the following items:
    1. Trees Underneath: Pruning trees growing directly under and growing into the facility/utility space.
    2. Trees Along Side: Pruning of trees growing directly along side and growing into or toward the facility/utility space.

3.09 PRUNING SCHEDULE

A. Pruning types shall apply as follows:
    1. All of the pruning type(s) as applicable are required at each tree.
    2. Hazard Reduction Pruning consisting of crown cleaning and crown raising to an eight (8) feet height clearance from grade (unless directed otherwise by the Landscape Architect and Owner).
        a. Hazard Reduction Pruning shall be completed to remove branches/laterals 2 inch and greater.
    3. Crown Restoration and Utility Pruning shall apply to all trees on the remainder of the site not within the previously identified areas.

B. All of the pruning type(s) as applicable are required at each tree.
   1. All pruning shall be completed to remove branches/laterals 1/8 inch and greater.

3.10 CROWN IMPACTS

A. Trees impacted by construction shall be limited to a maximum of 30 percent of the viable portion of a tree's crown removed as approved by the Landscape Architect and Owner.
   1. Removal of more than 30 percent of the viable portion of a tree's crown will necessitate the tree's removal and replacement at the Contractor's expense.
   2. Replacement shall be governed at the ratio of 1 inch of new tree per inch of tree removed up to trees of size less than 24" caliper.
   3. For trees 24" caliper and greater the ratio shall be 3 inches per new tree per inch of tree removed.
   4. Replacement trees are to have a one (1) year warranty. Refer to Section 32 9300 - EXTERIOR PLANTS.

3.11 APPROVAL: NO MAJOR LIMBS OR STRUCTURE WILL BE CUT OR REMOVED WITHOUT PRIOR APPROVAL OF THE LANDSCAPE ARCHITECT AND OWNER.

3.12 STERILIZATION:

A. All tools used will be sterilized with Clorox bleach prior to use and between each tree. Residue from sterilization operation shall be diluted so as not to damage any vegetation.
   1. At trees known to be diseased and where there is danger of transmitting that disease, tools are to be disinfected after each cut.

3.13 PAINT CUTS: PAINT CUTS MORE THAN 1 INCH IN DIAMETER WITH AN APPROVED TREE WOUND PAINT ON TREES OF OAK SPECIES.

A. Paint immediately after cutting; in no instance no longer than 30 minutes.

3.14 FERTILIZATION OF PRESERVED TREES

A. All existing trees shall be fertilized.

B. Fertilize existing trees that will be impacted by construction activities taking place within the dripline, including but not limited to trenching and grading.

C. Apply fertilizer as a vertimulch using a 2.5 inch auger. Inoculate within and fertilize beyond the drip line on 2.5 foot centers. (reference manufacturer's directions).
   1. Remove mulch from immediate area to be drilled.
   2. Apply 4 ounces directly onto soil forming a small pile.
   3. Drill directly through small pile of product to an 8" depth.
   4. Mix product and soil by drilling up and down 2 or 3 times.
   5. All soil and product mixture shall be put in the hole.
   6. Step on the hole to pack the mixed material.
   7. Replace mulch.
   8. Water to soil saturation.

3.15 PLACEMENT OF MULCH

A. Mulch base of all existing trees over area covering fifty (50) percent of the tree RPZ with six (6) inch deep mulch layer.
   1. If existing trees are grouped, the entire area is to be mulched in between the trees.
   2. Layout of mulched area to be approved by Landscape Architect.

3.16 CLEANUP

A. Wood and debris shall become property of the Contractor and shall be removed from the site. Cost of disposal to be paid by Contractor.
   1. Contractor's option - Wood from tree removal and pruning activities can be double shredded/grinded and used on site as mulch at locations as approved by Landscape Architect pending site conditions can accommodate.

B. If acceptable to [Owner/Landscape Architect], wood from tree removal and pruning activities can be double shredded/grinded and used on site as mulch at locations as approved by Landscape Architect.

END OF SECTION

SECTION 31 2323

FILL AND BACKFILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling, backfilling, and compacting for footings.

B. Backfilling and compacting for utilities outside the building to utility main connections.

C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

D. Topsoil placement in landscape areas.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete.

B. Grading - Refer to Civil.

C. Excavation - Refer to Civil.

D. Section 31 1330 - Treatment of Existing Trees: Preservation of existing trees and vegetation.

E. Section 03 3000 - Cast-in-Place Concrete.

1.03 PRICE AND PAYMENT PROCEDURES

A. General Fill:
   1. Measurement Method: By the cubic yard.
   2. Includes: Excavating existing soil, supplying fill; stockpiling, scarifying substrate surface, placing where required, and compacting.

B. Structural Fill:
   1. Measurement Method: By the cubic yard.
   2. Includes: Excavating existing soil, supplying fill; stockpiling, scarifying substrate surface, placing where required, and compacting.

C. Granular Fill:
   1. Measurement Method: By the cubic yard.
   2. Includes: Excavating existing material, supplying fill; stockpiling, scarifying substrate surface, placing where required, and compacting.

D. Aggregates:
   1. Measurement Method: By the cubic yard.
   2. Includes: Excavating existing material; supplying fill; stockpiling, scarifying substrate surface, placing where required, and compacting.

1.04 REFERENCE STANDARDS

A. ASTM C 33 - Standard Specifications for Concrete Aggregates; 2003.

B. ASTM C 150 -Standard Specification of Portland Cement; 2004a.

C. ASTM D 448 - Standard Classification for Sizes of Aggregate for Road and Bridge Construction; 2003a

D. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2007.

E. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2007.

F. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2009.

G. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2008.

H. ASTM D 2940 - Standard Specification for Graded Aggregate Material fir Bases or Subbases for Highways or Airports; 2003.

I. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2010.

J. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2010.

1.05 DEFINITIONS

A. Finish Grade Elevations: Indicated on drawings.

B. Subgrade Elevations: As required to establish finish grade elevations.

1.06 SUBMITTALS

A. See Section 01330 - Submittals.

B. Samples: 10 lb sample of each type of fill; submit in air-tight containers to testing laboratory or as required by testing laboratory.

C. Materials Sources: Submit name of imported materials source.

D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

E. Compaction Density Test Reports.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide sufficient quantities of fill if needed to supplement material obtained from the site to meet project schedule and requirements. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where designated by Owner's Representative.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
      a. Soil stripped for use as topsoil shall be stockpiled separately per shade or sun exposure per location stripped from site.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

C. Verify that survey bench marks and intended elevations for the Work are as indicated.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.

B. General Fill- Backfill and fill materials ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM: free from rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter and having a plasticity index (PI) of less than 30.
   1. Unsatisfactory soil materials include ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
   2. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

C. Structural Fill: Subbase and base material naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand, ASTM D2940, with at least 95 percent passing a 1-1/2 inch sieve and not more than 8 percent passing a No. 200 sieve.

D. Engineered/Structural Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand, ASTM D 2940, with at least 90 percent passing a 1-1/2 inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a number 8 sieve.

F. Concrete for Fill: Lean concrete.

G. Controlled Density Fill (CDF): Non-segregating, flowable, self consolidating, low-shrink material that flows into place without leaving voids and cures into a stiff non plastic material with ASTM C150, Type II or V cement, sand and pea gravel mixture 3/8 inch maximum in size with compressive strength after 3 days exceeding 25 psi and an unconfined compressive strength at 28 days less than 1000 psi.

H. Subbase and Base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand, ASTM D 2940, with at least 95 percent passing a 1-1/2 inch sieve and not more than 8 percent passing a No. 200 sieve.

I. Sand: ASTM C 33; fine aggregate, natural or manufactured sand.

J. Topsoil (stripped from site): Topsoil stripped from site for use in landscape work shall be screened to remove all stone debris and undesirable matter 1 inch in size or greater.

K. Topsoil (supplemental): Topsoil to be furnished, when required to supplement topsoil stripped from site, shall be secured from an approved off-site location.
   1. Fertile, friable, natural loam containing a liberal amount of humus and shall be capable of sustaining vigorous plant growth.
   2. Free of stone, lumps and clods of hard earth 1 inch diameter and greater, plants or their roots, sticks and other extraneous matter.
   3. Be at least 90 percent weed free.
   4. Under no circumstances will topsoil be accepted unless it is free of the aforementioned contaminants.
   5. Use of non-cohesive "sandy loam" shall not be acceptable.

2.02 ACCESSORIES

A. Filter Fabric: Water pervious type, polyester non woven geotextile fabric; provide Mirafi 140N or approved equivalent.

2.03 SOURCE QUALITY CONTROL

A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

B. If tests indicate materials do not meet specified requirements, change material and retest.

C. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

B. Refer to Civil sections for additional requirements.

3.02 PREPARATION

A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Fill up to subgrade elevations unless otherwise indicated.

C. Employ a placement method that does not disturb or damage other work.

D. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.

G. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.

H. Slope grade away from structures and improvements minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

I. Correct areas that are over-excavated.
   1. Load-bearing foundation surfaces: Fill with concrete.
   2. Load-bearing foundation surfaces: Use structural fill, flush to required elevation, compacted to 100 percent of maximum dry density.
   3. Other areas: Use general fill, flush to required elevation, compacted to minimum 95 percent of maximum dry density.

J. Compaction Density Unless Otherwise Specified or Indicated:
   1. Under paving, slabs-on-grade, and similar construction; 95 percent of maximum dry density.
   2. At other locations: 90 percent of maximum dry density.

K. Reshape and re-compact fills subjected to vehicular traffic.

3.04 FILL AT SPECIFIC LOCATIONS

A. Use general fill unless otherwise specified or indicated.

B. Structural Fill :
   1. Use structural fill.
   2. Fill up to subgrade elevations.
   3. Maximum depth per lift: 6 inches, compacted.
   4. Compact to minimum 95 percent of maximum dry density.

C. Pervious Structural Fill :
   1. Use granular fill.
   2. Fill up to subgrade elevations.
   3. Maximum depth per lift: 8 inches, compacted.
   4. Compact to minimum 95 percent of maximum dry density.

D. Over Buried Drain Piping from Drinking Fountain:
   1. Bedding: Use sand.
   2. Cover with general fill.
   3. Fill up to subgrade elevation.
   4. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.

E. At Landscape Areas:
   1. Use general fill.
   2. Fill up to 6 inches below finish grade elevations.
   3. Compact to 95 percent of maximum dry density.
   4. See Section 31 2200 for topsoil placement.

F. At French Drains:
   1. Use granular fill.
   2. Fill up to 6 inches below finish grade.
   3. Compact to 95 percent of maximum dry density.

G. Under Monolithic Paving :
   1. Compact subsoil to 95 percent of its maximum dry density before placing fill.
   2. Use general fill.
   3. Fill up to subgrade elevation.
   4. Compact to 95 percent of maximum dry density.
   5. See Section 32 1123 for aggregate base course placed over fill.

3.05 TOLERANCES

A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.

B. Top Surface of Filling Under Paved Areas: Plus or minus 1/2 inch from required elevations.

3.06 FIELD QUALITY CONTROL

A. Perform compaction density testing on compacted fill in accordance with ASTM D1556 or ASTM D2167

B. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor").

C. If tests indicate work does not meet specified requirements, remove work, replace and retest. See Section 01400 for procedures.

D. Frequency of Tests: Frequency of tests shall be adequate to guarantee proper compaction. In no case less than one (1) test per lift per 150 linear feet of backfill.

E. Proof roll compacted fill at surfaces that will be under slabs-on-grade, pavers, and paving.

3.07 CLEANING

A. Leave unused materials in a neat, compact stockpile.

B. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water. Unused material may be distributed on site at approval of Owner's Representative.

C. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION

SECTION 32 3119
DECORATIVE METAL FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Decorative steel fences and gates.

1.02 RELATED REQUIREMENTS

A. Section 03 3300 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process; 2010.

B. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus; 2009.

C. ASTM D523 - Test Method for Specular Gloss; 2008.

D. ASTM D714 - Test Method for Evaluating Degree of Blistering in Paint; 2002 (Reapproved 2009).

E. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments; 2008.

F. ASTM D2244 - Test Method for Calculations of Color Differences from Instrumentally Measured Color Coordinates; 2009b.

G. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact) ; 1993 (Reapproved 2010).

H. ASTM D3359 - Test Method for Measuring Adhesion by Tape Test; 2009e2.

I. ASTM F2408 - Ornamental Fences Employing Galvanized Steel Tubular Pickets; 2009.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings:
   1. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.

D. Manufacturer's Warranty.

1.05 WARRANTY

A. Finish: 10 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Decorative Metal Fences:
   1. Ameristar Fence Products, Inc: www.ameristarfence.com.; WireWorks Plus
   2. Ametco Manufacturing Corp.: www.ametco.com.; Amopanel Design
   3. Design Master Fencing System: www.designmasterfence.com.; Designmaster Fence Panel.

2.02 FENCES

A. Fences: Complete factory-fabricated system of posts and panels, accessories, fittings, and fasteners; finished with electrodeposition coating, and having the following performance characteristics:
   1. Capable of resisting vertical load, horizontal load and infill performance requirements for fence categories defined in ASTM F2408.

B. Electro-Deposition Coating: Multi-stage pretreatment/wash with zinc phosphate, followed by epoxy primer and acrylic topcoat.
   1. Total Coating Thickness: 2 mils, minimum.
   2. Color: As selected by Architect from manufacturer's standard range.
   3. Coating Performance: Comply with general requirements of ASTM F2408.
      a. Adhesion: ASTM D3359 (Method B); Class 3B with 90 percent or more of coating remaining in tested area.
      b. Corrosion Resistance: ASTM B117, D 714 and D 1654; 1/8 inch coating loss or medium No.8 blisters after 1,500 hours.
      c. Impact Resistance: ASTM D2794; 60 inch pounds.
      d. Weathering Resistance: ASTM D523, D 822 and D 2244; less than 60 percent loss of gloss.

C. Steel: ASTM A653/A653M; yield strength 45,000 psi, minimum.
   1. Hot-dip galvanized; A 653/A653M, G60.

2.03 WELDED WIRE STEEL FENCE

A. Fence Panels: Fusion welded; 6 feet high by 8 feet long.
   1. Panel Style: Ameristar Wire Works Plus (basis of design).
   2. Steel wire mesh: 6 gauge horizontal and vertical pre-galvanized wire; 2 x 6 inch pattern.
   3. Attach panels to posts with manufacturer's standard panel brackets.

B. Posts:
   1. Size: 2 inches square by 16 gage, with manufacturer's standard cap.
   2. Post Cap: Flush plate.

C. Rails: Manufacturer's standard, double-wall steel tube 2 inch square by 16 gage.

2.04 GATES

A. Swing Gates
   1. Frame: 2 inch square x 12 gauge with gussets at each corner. Gates that exceed 6 feet in width will have 2 inch square x 12 gauge intermediate upright.
   2. Gate Posts: Sized according to manufacturer's recommendations based on gate width.
   3. Hardware: Manufacturer's standard components capable of accepting Owner supplied padlock.

B. Rolling Gate: Steel frame as indicated on the drawings custom fabricated to accept welded wire fence panels as specified. Shop painted to match selected fence color.
   1. Wheels: 4 inch diameter steel wheels, v-grooved to mate with V-track; on steel axle mounted in prime painted steel mounting box. King Architectural Metals #30-400-4 w/ 30-40-BX or equivalent with matching cold-rolled welded steel angle track mounted on mounting plates.
   2. Roller Guides: Non-marring, rubber rollers on steel spindles mounted in steel brackets, 6 inches tall; King Architectural Metals #30-410-6 or equivalent.

2.05 OPERATING SYSTEM

A. Motorized Slide Gate Operator: Fully enclosed hydraulic motors which propel a rigid drive rail through two compressed polyurethane wheels in housing.
   1. Motor and Drive: 2 HP 208/230V 60Hz single phase, hydraulic slide gate operator; SlideDriver by HySecurity (www.hysecurity.com) or equivalent.
   2. Operator: Manufacturer's standard proximity card reader.

3. Safety Loops: Provide two entry loops and one exit loop. Coordinate installation of loops with paving.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Set fence posts in accordance with the manufacturer recommended spacing.

C. Space gate posts according to the manufacturers' drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected.
   1. Base type and quantity of gate hinges o the application; weight, height, and number of gate cycles.
   2. Identify the necessary hardware required for the application on the manufacturer's gate drawings.
   3. Provide gate hardware by the manufacturer of the gate and install per manufacturer's recommendations

3.02 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From Indicated Position: 1 inch.

C. Minimum distance from property line: 6 inches..

3.03 PROTECTION

A. Protect installed products until completion of project.

END OF SECTION

SECTION 32 8442

LANDSCAPE IRRIGATION SYSTEMS

PART 1- GENERAL

1.01 SECTION INCLUDES

A. Installation of a complete automatic underground irrigation system as shown on the drawings as hereinafter specified, including the furnishing of all labor, equipment, appliances and materials and in performing all operations in connection with the construction adjustment to ensure coverage and proper operations of the irrigation system.
   1. System to be supplied by a dedicated irrigation water meter.

B. Temporary irrigation for the establishment of landscape areas not covered by the automatic irrigation system.

1.02 RELATED REQUIREMENTS

A. Section 01 50 00 - Construction Facilities and Temporary Controls.

B. Section 01 78 00 - Contract Closeout: Submitting Warranty and As-Built Drawings.

C. Section 31 13 30 - Treatment of Existing Trees.

D. Section 32 91 13 - Soil Preparation.

E. Section 32 92 19 - Seeding.

F. Section 32 92 23 - Sodding.

G. Section 32 93 00 - Exterior Plants.

H. Section 32 93 10 - Landscape Maintenance.

I. Division 22 - Plumbing: Connection to potable water service.

J. Division 26 - Electrical: Electrical distribution to Controllers.

1.03 ASTM REFERENCES

A. D-2564 Standard specification for Solvent Cements for Poly Vinyl Chlorinated (PVC) Plastic Pipe and Fittings.

B. F-656 Standard specification for Primers for Poly Vinyl Chlorinated (PVC) Plastic Pipe and Fittings.

C. D-1785 Standard specification for Poly Vinyl Chloride (PVC) Plastic Pipe Schedules 40 and 80.

D. D-2241 Standard specification for Poly Vinyl Chloride (PVC) pressure-rated pipe.

E. D-2464 Standard specification for Threaded Poly Vinyl Chloride (PVC) Plastic Pipe Fittings Schedule 80.

F. D-2466 Standard specification for Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Socket Type Schedule 40.

G. D-2467 Standard specification for Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Socket Type Schedule 80.

1.04 SITE CONDITIONS

A. Verification of Dimensions:
   1. Scaled and figured dimensions are given for estimate purposes only.
   2. Check and verify all dimensions and sizes, etc., and assume full responsibility for the correctness of all such items before proceeding with any work.

B. Existing Conditions:
   1. Tie new work to existing conditions and controls.
   2. Finished grades shall bear proper relationship to such controls.
   3. Adjust new work as necessary and as directed to meet existing conditions and fulfill intent of the plans.

C. Point of Connection for Water Supply to Irrigation System:
   1. Connect to dedicated irrigation meter as indicated.

D. Verification of Water Pressure:
   1. Verify actual on-site water pressure from the source prior to installing irrigation system.
   2. This pressure reading must exceed design pressure by 10%.
   3. Notify the Landscape Architect for resolution when on-site pressure does not meet this requirement.
   4. Do not willfully proceed with construction as designed when pressure problems exist.
   5. The Irrigation Contractor assumes full responsibility for all necessary revisions due to failure to give such notification.

E. Obstructions:
   1. Stop work and immediately contact the Landscape Architect before proceeding if any unknown utilities and obstacles are encountered during the construction period.
   2. Such obstructions shall be removed or relocated or the work adjusted as directed by the Landscape Architect.
   3. The Contractor shall be held liable for any and all damages if work proceeds without contacting the Landscape Architect.

F. Underground Utilities:
   1. Contact the appropriate authorities to locate underground utilities prior to initiating any excavation or trenching.
   2. Coordinate with other trades on project.

G. Applicable Codes:
   1. Unified Development Code. (City of San Antonio).
   2. N.E.C. and local electrical codes, ordinances and regulations.
   3. Uniform Plumbing Code.
   4. Texas Commission on Environmental Quality (TCEQ) Rules for Landscape Irrigation.
   5. Permits:
      a. Obtain any permits or approvals required for inspection and installation.
      b. Arrange for any required inspections by local authorities during the course of the construction.
      c. The Contractor shall be responsible for all fees and costs associated with the water service connection, water utilized during construction up to date of Final Acceptance and related work.
      d. Obtain backflow preventer test(s).

1.05 SUBMISSION FOR APPROVAL

A. The materials shall be new, and the best procurable.
   1. Only materials conforming to these specifications shall be used in the work, and such materials shall be used only so long as the quality of said materials remains equal to the requirements of the specifications.
   2. Furnish approved materials from other sources if, for any reason, the product from any source at any time before commencement or during the prosecution of the work proves unacceptable.

B. Only the specified items shall be used unless the clause "or equal" is used in the specification pertaining to a material or article.
   1. Obtain the written approval of the Landscape Architect prior to purchase or use of any substitute in the event that the clause "or equal" is used in the specifications pertaining to a material or article. Such approval or disapproval shall be considered final.

C. Furnish the articles, equipment, materials or processes specified by name in the drawings and specifications.
   1. No substitutions will be allowed without prior approval by the Landscape Architect.

2. If the Contractor desires consideration of an "or equal" material substitution, he shall furnish performance data and shop drawings for any changes required to the arrangement and spacing of the sprinkler heads or modification to any other component of the irrigation system.

D. The following procedures shall be used to obtain approval of a substitute sprinkler as an equal:
   1. Actual samples of each type of sprinkler proposed as a substitute.
   2. Manufacturer's catalog sheet showing full specifications and operating range of each type sprinkler proposed as a substitute, i.e., flow rate, pressure requirements, and radius of coverage.
   3. Detailed pressure loss computations based on the consumption of the proposed substitute sprinkler; if the manufacturer's specifications show that any one of the three characteristics in the above paragraph is a variance with the specified sprinklers. These pressure loss computations must prove that the proposed substitute sprinkler will perform in accordance with the intent of the designed sprinkler system either with the same piping and head layout design or with a change of either. (If design change is required, detailed drawings must accompany the request for approval of the substitute.) The detailed pressure loss computations must encompass the following:
      a. The design pressure is defined as the actual pressure required to overcome all pressure losses and maintain the required residual pressure at the sprinkler.
      b. Pressure loss computations must be based on an acceptable table of pressure losses for the type and size pipe to be used.
      c. All pressure loss tables are for straight pipe only, and an acceptable allowance must be made for the additional losses incurred in fittings.
      d. Allowance must be made for the pressure loss through all valves based on the specifications of the manufacturer of each type valve.
   4. The decisions of approval or disapproval will be based on the comparative ability of the sprinkler to perform fully all purposes and functions of mechanics and general design and construction material considered to be possessed by the sprinkler.
   5. Approval of a substitute sprinkler shall not relieve the Contractor of his responsibility to demonstrate that the final installed sprinkler system will operate according to the intent of the originally designed and specified system.

1.06 ADJUSTMENTS AND TESTS

A. Make the following tests before final acceptance of the installed system:
   1. Flush out, cleaning entire existing system (includes both new and existing), and clean all valves (manual and automatic) of any rock and other debris which may impede the operation of the system when placed in to operation.
   2. Flush out entire system of any rock or debris which may impede the operation of the system when placed in to operation.
   3. Check all sprinklers for proper operation and optimum coverage with minimal or no overspray on walls and pavements. Head locations and nozzles shall be changed / adjusted as required for 100% coverage.
   4. Install pressure gauge at the base of the sprinkler most distant from the zone valve, in terms of the length of piping through which the water must flow to reach the sprinkler. This sprinkler must operate during the test.
   5. With the section of sprinklers operating, adjust the pressure regulator and / or throttle control on each zone valve to provide the required head pressure as indicated on plans.
   6. Adjust and balance the pressure throughout the entire system to optimize performance.
   7. Provide and install pressure regulator if static pressure exceeds design pressure by 15%.

B. All tests shall be observed by the Landscape Architect or designated representative.

C. Contractor shall provide written notice of request for observation to the Landscape Architect a minimum of forty-eight (48) hours prior to testing

1.07 CONTROL OF WORK

A. Contractor Qualifications:
   1. All work shall be installed by skilled personnel, proficient in the trades required, in a neat, orderly and responsible manner with recognized standards of workmanship.
   2. The Contractor must be a current licensed irrigator of the State of Texas.

B. The Landscape Architect shall:
   1. Decide all questions relative to the quality of workmanship and materials furnished during construction.
   2. Decide all questions relative to the interpretation of the drawings and specifications and the acceptable fulfillment of the contract.

C. Proceed with the increased, decreased or altered work only upon duly prepared and executed Change Order by the Owner.

D. Provisions by Others: If some portion of the work is to be provided by others, such as sleeves or electrical power to controller, to locations as shown on plans, the Contractor shall coordinate the exact locations of such with the General Contractor and others as required.

E. On site observation:
   1. The Landscape Architect or Owner's representative may visit the site to observe work underway at any time during the installation of the irrigation system.
   2. Upon request, the Contractor shall be required to uncover specified work as directed by the Landscape Architect/Owner's representative without compensation.
   3. The Contractor shall replace the work at his own expense should the material, workmanship or method of installation not meet the standards specified herein.

F. Closing-in Uninspected Work:
   1. This Contractor shall not allow or cause any of his work to be covered up or enclosed until it has been tested by the Contractor and observed by the Owner's Representative or Landscape Architect.
   2. Should any of his work be enclosed or covered up before such observation, and/or testing, he shall uncover his work.
   3. After it has been tested, observed and approved, backfill as required.

1.08 EXPLANATION OF DRAWINGS

A. Due to the scale of drawings, it is not possible to indicate all offsets, fittings, sleeves, etc., which may be required.
   1. Carefully investigate the structural and finished conditions affecting all of his work and plan work accordingly, furnishing such fittings, etc., as may be required to meet such conditions.
   2. Drawings are generally diagrammatic and indicative of the work to be installed.
   3. The work shall be installed in such a manner as to avoid conflicts between irrigation systems, existing planting and trees, new planting, and other construction on site.

B. All work called for on the drawings by notes or details shall be furnished and installed whether or not specifically mentioned in the specifications.

C. Do not willfully install the irrigation system as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in area dimensions exist that might not have been considered in design.
   1. Bring such obstructions or differences to the attention of the Owner's authorized representative.
   2. In the event this notification is not performed, the irrigation contractor shall assume full responsibility for any revisions necessary.
   3. Contractor shall be responsible for all costs involved with work.

1.09 PROJECT CLOSEOUT

A. The Landscape Architect is to provide one inspection trip to establish the Substantial Completion of a Project and a second inspection trip to establish the Final Acceptance of the project.
   1. Any additional cost to the Landscape Architect required because the Contractor has failed to adequately complete or correct the Contract work before requesting an inspection shall be invoiced to the Owner, and at his discretion, back charged to the Contractor for payment.
   2. Any additional cost to the Landscape Architect required because the Contractor has failed to adequately complete or correct the Contract work requiring more than one inspection beyond Substantial Completion shall be invoiced to the Contractor by the Landscape Architect for payment.

1.10 SUBMITTALS

A. Submit shop drawings in accordance with Section 01 30 00.

B. Furnish to the Landscape Architect, prior to installation, the following:
   1. Pressure Verification Letter: Verification of on-site static water pressure. Provide written documentation of time, date and location of pressure reading on Company Letterhead.
   2. Certification: Copy of Irrigator's License on Company Letterhead.
   3. Equipment and Materials:
      a. Provide manufacturer's catalog sheets with a table of contents to include all material, supplies and equipment required for a complete and appropriate installation.
      b. Clearly identify each product applicable to the installation.
      c. Cross out non-related material to the submittal.
   4. Layout of temporary irrigation.

C. At completion of irrigation installation. (Refer to end of section for Requirements):
   1. Wire routing layout (active, spare and future wires) indicated on record drawings.
   2. Irrigation Installation Certification Letter (copy, original to be issued to inspector).
   3. Items and Equipment.
   4. Record Drawings.
   5. System Instructions.

PART 2 - PRODUCTS

2.01 MATERIALS, SUPPLIES AND EQUIPMENT

A. Manufacturer's specifications and installation instructions of all equipment supplied shall become a part of the specifications.

B. All piping materials and equipment associated with non-potable water use shall be identified and marked accordingly as required by governing authority. Contractor is responsible for insuring conformance.

C. Abbreviations:
   1. P.V.C. Polyvinyl Chloride
   2. S.F. National Sanitation Foundation
   3. P.S.I. Pounds Per Square Inch
   4. I.P.S. Iron Pipe Size
   5. N.E.C. National Electrical Code

D. Pressure Reducing Valve:
   1. Cast bronze water pressure reducing valve with 300 lbs. max rating with integral by-pass check valve and adjustment range as required for performance of system.
   2. Wilkens 500; ½" - 3"; reduced pressure range of 25-75 psi or approved substitute.
   3. Refer to plan for size, model and location.

E. Wye Pattern Strainers
   1. Bronze Wye Strainer, ½" -2"; FIPT; model 650A as manufactured by Febco or approved substitute.

2. Refer to plan for size, model and location.

F. Backflow Prevention device
   1. Double Check Valve Assembly
      a. Conbraco 40-100 series with brass ball valves or approved substitute.
      b. Refer to plan for size, model and location.

G. Master Control Valve:
   1. PEB series as manufactured by Rain Bird.
   2. Refer to plan for size, model and location.

H. P.V.C. Pipe:
   1. Continuously and permanently marked with the manufacturer's name, pipe size, class or schedule, type and number established by commercial standards.
   2. Lateral piping:
      a. 1/2": Class 315 solvent weld PVC pipe; ASTM D-2241
      b. 3/4" to 3": Class 200 solvent weld PVC pipe; 4" and larger: gasketed belled-spigot type PVC pipe, Class 200, SDR21; ASTM D-2241
   3. Mainline piping:
      a. Schedule 40 solvent weld; ASTM D-1785 and ASTM D-2665

I. Metal Pipe:
   1. Galvanized steel pipe: ASTM A 120, Schedule 40.
   2. Copper Pipe (below ground use): Soft-annealed, Type K.
   3. Copper Pipe (mainline piping above ground): Type K, rigid.
   4. Copper Pipe (lateral piping above ground): Type M, rigid.
   5. Insulation Wrap: Division 15
   6. Conduit: Galvanized rigid steel

J. Fittings:
   1. PVC (Unplasticized polyvinyl chloride): shall have a working pressure equal to or greater than that of the pipe.
      a. Schedule 40 when joining PVC to PVC.
      b. Schedule 80 when joining PVC to metal.
      c. All threaded fittings shall be Schedule 80.
   2. Galvanized steel, ANSI B16.3 galvanized malleable-iron threaded fittings.
   3. Copper : Solder type wrought copper fittings; solder 50/50 (tin/lead) on lateral piping
      a. Lead-free solder when taping potable water piping.
      b. Silver soldered or brazed when below paving per governing plumbing code.

K. Flexible Attachment:
   1. Turf and Shrub Sprays:
      a. 1/2" x 12" preassembled swing joint assembly constructed of polyethylene tubing with swivel ells on each end.
   2. Small Turf Rotors (1/2" FIPT):
      a. 1/2" x 12" preassembled swing joint assembly constructed of polyethylene tubing with swivel ells on each end.
   3. Quick Coupler Valves:
      a. Unitized, factory assembled swing joint assembly constructed of rigid PVC and rubber O-ring sealed swivel joints; sized per valve; molded components exceeding ASTM Schedule 80 body wall thickness requirements and pressure rated to 315 P.S.I. at 73F per ASTM D3139.

L. Manual Valves:
   1. Isolation valves on mainline:
      a. Three (3) inches and smaller:
         1) PVC ball valve, PTFE seat, full port, constructed from PVC Type 1 Cell Classification 12454; pressure rating to 235 PSI, grey in color.
         2) Refer to plan for size, model and location.

2. Isolation valves at remote control valves and quick coupler valves:
    a. PVC ball valve, PTFE seat, full port, constructed from PVC Type 1 Cell Classification 12454; pressure rating to 235 PSI, grey in color.

M. Quick coupler valves and accessories
1. 44 NP quick coupling valve with purple locking cover and 44K key by Rain Bird with Sh-1 hose swivel or approved substitute.
2. 2049 Locking cover key or approved substitute.
3. Refer to plan for location.

N. Quick coupler stabilization
1. Stabilizer Unit: Quick coupler cast iron restrainer with stainless steel bolt as manufactured by Leemco, Inc., 1-909-422-0088 (www.leemco.com <http://www.leemco.com>).

O. Remote Control Valves:
1. PEB series as manufactured by Rain Bird.
2. Refer to plan for size, model and locations.
3. Provide factory or field installed pressure regulation where indicated on drawings.

P. I.D. Tag: Standard valve I.D. tag with Alpha-Numeric numbering to identify controllers and remote control valve sequence as manufactured by T. Christy Enterprises or approved substitute.

Q. Sprinkler Heads and Nozzles:
1. Tree bubbler assemblies; Refer to plans for types, model, gpm, etc., and location.
2. Lawn and shrub spray sprinkler assemblies; Refer to plans for types, model, radius, arc, etc., and location.
3. Rotary sprinkler assemblies; Refer to plans for types, model, radius, arc, etc., and location.
4. Nozzles and sprinkler assemblies shall be of the same manufacturer unless indicated otherwise on drawings.

R. Shrub Risers:
1. No Shrub risers shall be installed without written approval of the Landscape Architect.

S. Drip Irrigation; Provide all necessary fittings and accessories as recommended or required by the manufacturer for the installation of the specified product.
1. Tubing and fittings shall be of the same manufacturer unless indicated otherwise on drawings.
2. Rain Bird XFS Series Dripline or approved substitute.
3. Refer to plans for locations.

T. Valve Boxes:
1. Pressure Regulator:
    a. Pentek 10" circular series valve box with T-Top locking cover; model #184501with locking screw #143004 and extension(s) #181026 as required or approved substitute.
2. Master Control Valve
    a. Pentek 10" circular series valve box with T-Top locking cover; model #184501with locking screw #143004 and extension(s) #181026 as required or approved substitute.
3. Manual Valves:
    a. Pentek 10" circular series valve box with T-Top locking cover; model #184501 with locking screw #143004 and extension(s) #181026 as required or approved substitute.
4. Remote Control Valves:
    a. Pentek 12" rectangular series valve box with T-Top cover; model #174501 and extension(s) #170102 or #170103 as required or approved substitute.
5. Drip Zone Assemblies:
    a. Pentek 12" rectangular series valve box with T-Top cover; model #174501 and extension(s) #170102 or #170103 as required or approved substitute.
6. Splice Boxes:
    a. Pentek 10" circular series valve box with T-Top locking cover; model #184501with locking screw #143004 and extension(s) #181026 as required or approved substitute.

7. Drainage Backfill: Cleaned gravel or crushed stone, graded from 1-inch maximum to 3/8-inch minimum.
8. Filter Fabric: Continuous filament, non-woven needle punched, polypropylene, porous garden fabric such as Earth Felt by Soil-Tec, Inc. or approved substitute.

U. Automatic Control System:
1. Refer to plan for model.
2. Refer to plan for location.

V. Sensors:
1. Mini-Clik; as manufactured by Hunter Industries.
2. Freeze-Clik; Freeze shut off device; as manufactured by Hunter Industries.
3. Refer to plan for location(s).
4. Install sensor(s) per details.
5. Install sensor per manufacturer's recommendations.

W. Wire:
1. Single conductor copper wire with 4/64" PVC insulation; approved for direct burial on NEC Class II circuits.
2. Multi conductor copper wire with PVC insulation; approved for direct burial on NEC Class II circuits.

X. Valve Wire Splice Connector:
1. WC-10, WC-14R and WC-16 Wade Connectors; size as required per application by Wade Enterprises, San Antonio, Texas 210/694-0203 or approved substitute.

Y. Enclosures:
1. Backflow Prevention Device
   a. Guard Shack PumpHouse power-coated steel enclosure. Refer to plans for color.
   b. Refer to plans for optional eqipment, size and location.

2.02 SOLVENTS, CEMENTS, PRIMERS AND JOINT COMPOUNDS:

A. General: All solvents, cements, primers, and joint compounds shall be approved for use by the Uniform Plumbing Code; ASTM D 2564 for PVC pipe and fittings.

B. Utilize appropriate type for application required:
1. All classes, schedules and types of PVC: Use Weld-On #P68 purple primer.
2. All classes, schedules and types of rigid PVC (excluding Schedule 80): Use Weld-On #700 or #705 solvent cement.
3. Schedule 80 PVC: Use Weld-On #705 solvent cement, color clear.
4. All classes, schedules and types of rigid PVC (including Schedule 80): Use Weld-On #705 solvent cement, clear color.
5. All rigid to flexible PVC: Use Weld-On #795 solvent cement, color clear.
6. Threaded Connections for PVC:
   a. Use All Seal Multi-Purpose sealant as manufactured by Weld-On for all threaded connections between PVC and metal pipe.
   b. Use polytetrafluoroethylene thread tape conforming to FED. MIL SPEC T-27730A or approved substitute for all threaded connections between VPC and valves.
7. Apply in accordance with manufacturer's instructions.

2.03 OTHER MATERIALS

A. All other materials, not specifically described but required for a complete and proper irrigation system installation, shall be new, first quality and subject to the approval of the Landscape Architect.

PART 3 - EXECUTION

3.01 TRENCHING AND BACKFILLING

A. General:
1. Verify on-site static water pressure and layout and verify all dimensions on the site prior to proceeding with work under this contract.

2. Layout and flag locations of all heads.
    a. Locations shall be approved by Landscape Architect, upon being given a minimum forty-eight (48) hours notice as to when layout will be ready for review.
    b. If Contractor installs irrigation work without review of the head layout, any modification to the head locations requested by the Landscape Architect shall be done at the Contractor's expense.
3. Obtain coverage test review from Landscape Architect prior to initiation of any landscape planting work.
4. Spacing of the sprinkler heads is shown on the drawings and may be exceeded only with the permission of the Landscape Architect.
5. Extreme care shall be exercised in excavating and working near underground utilities.
    a. Check civil, mechanical, electrical and plumbing drawings for location of new and existing utilities.
    b. Coordinate work with other trades on site.

B. Trees:
1. No machine trenching is to be done within drip line of trees.
2. Trenching is to be done by hand or by tunneling under root system by method approved by Landscape Architect; refer to Section 32 93 13 - TREATMENT OF EXISTING TREES.
3. Do not encroach more than 40% of the tree RPZ when trenching parallel. For lateral piping within the rPZ, trench to reach head locatin approaching on radius with branching structure of root system.
4. Piping layout is diagrammatic. Route piping around existing plant material in such a manner as to avoid damage to plants.
5. Do not cut any root over ¾" in diameter. Any cuts made shall be clean cuts without frayed ends.
6. Coordinate completion of piping installation prior to placement of landscape soils; refer to section 32 91 13, SOIL PREPARATION.

C. Existing Plant Beds:
1. Take care to minimize disruption of plans when trenching is necessary through existing plant beds.
2. Restore all plantings indicated on plans to remain.
3. Apply dress mulch to all disturbed areas to match depth of existing mulch.

D. Property Line:
1. Mainline pipe, wires and valves shall be trenched inside of property line.
2. For streetscape trees, mainline pipe, wires and valves shall be trenched inside of street right of way.

E. Along Curbs and Asphalt Paving:
1. Trenching parallel to curbs and/or edge of asphalt paving to be offset a minimum 3' from back of curb or edge of asphalt.
2. Lateral feed to heads located along curbs and/or edge of asphalt paving to be trenched perpendicular to curb or edge of asphalt from lateral ran parallel to curb.

F. Alignment:
1. Trenches shall be dug straight, and pipe shall have the continuous support of the ditch bottom and shall be laid to an even grade.
2. Trenching operations shall follow the layout indicated on the drawings.
3. Deviations will be allowed to avoid obstructions. Note deviations on record drawings.

G. Protection:
1. Protect existing trees, lawns and plantings.
2. Remove and replant as necessary to complete installation.
3. Replace damaged lawn areas and plants with new to match existing.

H. Trench Depth: Excavate trenches to a depth of 3 inches below invert of pipe and to provide the following minimum cover over top of installed piping:
1. Main supply lines - 18 inches to top of pipe.

2. Lateral supply lines - 12 inches to top of pipe.
3. Lines under paving - 18 inches inside PVC sleeve unless indicated otherwise.
4. Do not exceed 24" maximum depth to piping unless specifically indicated otherwise on plans.

I. Backfill:
1. Initial backfill on all lines shall be a sand "envelope" 3 inches below, around and above pipe.
2. Complete backfill with clean material from excavation. Remove organic material as well as rocks and debris larger than ½ inch diameter.
3. Backfill to be compacted to dry density equal to the adjacent grades, without dips, sunken areas, humps or other irregularities.
4. Under no circumstances shall trenches be compacted by wheel rolling the ditch line.
5. Contractor shall be responsible for all and any settling of trenches from his work following the site planting.

J. Sleeves:
1. At new walkways, concrete and asphalt pavement (and elsewhere as required), provide PVC sleeves 18 inches / 24 inches maximum below bottom of paving materials; not all locations are indicated on plan.
2. Provide Schedule 40 PVC sleeves sized equal to twice the diameter of the pipe or combination of pipes enclosed within the sleeve.
3. Extend sleeve 24 inches beyond edge of pavement/structure at both ends.
4. Cap sleeves on both ends.
5. Mark each end of all sleeves with a 1”x2”x 3' wood stake. Label each stake “Irrigation Sleeve”.
6. Record triangulated dimensions to as-built at time of installation.
7. Pipe with joints in sleeves shall be bell end only, no couplers, and all bells shall be oriented the same direction.

K. Sleeves in Pavement: At walks or other paved surfaces where sleeves have not been provided, bore beneath pavement if possible. Where existing pavement must be cut to install landscape irrigation system:
1. Saw cut pavement smoothly to straight lines 6 inches wider than trench (3 inches each side of trench).
    a. Excavate trench to required depth and width.
    b. Remove cut out pavement and excavated material from the site.
    c. Backfill with flowable fill to within 6 inches of top of pavement. Continue to backfill to top of aggregate base with concrete.
    d. Repair or replace pavement cuts with equivalent materials and finishes to be flush with adjacent surface.
    e. In concrete paved areas, repairs shall be reinforced to match existing concrete pavement and doweled to the adjacent slab in a manner acceptable to the Landscape Architect.

L. Where trenching is required across existing lawns:
1. Existing Lawns:
    a. Backfill trench to within 6 inches of finished grade. Continue fill with acceptable topsoil and compact to bring sod even with existing lawn.
    b. The entire area disturbed by installation of system shall be raked smooth removing all rocks, roots and debris 1 inch in diameter or larger. The site shall be free from irregular surface changes and shall vary uniformly between fixed elevations.
    c. Lay turf species to match existing sod within twenty-four (24) hours from time of stripping.
    d. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod strips; do not overlap.
    e. Stagger strips to offset joints in adjacent courses. Tamp or roll lightly to ensure contact with subgrade.

f. Work sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering of adjacent grass.
g. Water sod thoroughly with a fine spray immediately after planting to obtain at least 6 inches penetration into the soil below the sod. Firmly press sod into contact with sod bed by rolling with roller weighing 100-150 pounds per lineal foot of roller.
h. Replace any restored lawn areas not in healthy condition equal to adjoining lawns 30 days after planting.

3.02 INSTALLATION

A. General:
1. The Contractor shall, before starting work on the irrigation system, carefully check on-site static water pressure and all finish grades to satisfy himself that he may proceed with the work.
2. Comply with requirements of the Uniform Plumbing Code.
3. Comply with the requirements or the Unified Development Code.
4. Comply with Texas Commission on Environmental Quality (TCEQ) Rules for Landscape Irrigation.
5. Provide all equipment as necessary and as appropriate for the installation.
6. Use the sprinklers, valves, piping, fittings, etc., of sizes and types as shown on the drawings and as called for in these specifications.
7. Coordinate with other trades as required to accomplish the installation.
8. Make adjustments as may be required to irrigation system to insure optimum operation of the system.
9. Excavate and expose existing equipment and piping when and where directed by the Landscape Architect and backfill when directed. Work to be performed at no additional cost to contract/Owner.

B. Connection to Main:
1. Connect to water source at location indicated on the drawings.
2. Maintain uninterrupted water service to surrounding existing facilities during normal working hours.
3. Arrange for temporary water shut-off with appropriate authorities a minimum of 24 hours prior to work.

C. Piping Layout:
1. Piping layout as indicated on the drawings is diagrammatic.
2. Deviate where necessary to avoid obstacles.
3. Install lines in such manner as to conform to the various details without altering the sequence of the various assemblies occurring along the pressure supply line.

D. Multiple Assemblies:
1. No multiple assemblies shall be installed on plastic lines.
2. Each assembly shall be provided with its own outlet.

E. Assemblies:
1. All assemblies specified herein shall be installed in accordance with the respective details.
2. In the absence of details, drawings or specifications pertaining to the specific items required to complete the work, perform such work in accordance with the best standard practice and to the satisfaction of the Landscape Architect.

F. Backflow Preventer:
1. Install above grade.
a. Install in an enclosure as indicated.
b. Install protection against freezing.
c. Install providing all clearances as required by applicable codes.

G. Pressure Reducing Valve:
1. Install pressure reducing valve before backflow preventer in separate valve box when static pressure exceeds design pressure by fifteen (15) percent.

H. Master Control Valve:
   1. Install master control valve in valve box after backflow preventer.
   2. Place in separate valve box.

I. Controller:
   1. Install automatic controller at location as indicated on plan.
   2. Coordinate provision of electrical requirements with others as required.
   3. Coordinate provision of galvanized steel conduit.
   4. Hardwire controller to power source.
   5. Coordinate provision of galvanized steel conduit for weather sensors with others as required.

J. Remote Section Valves:
   1. Install in valve box, arranged for easy adjustment and removal.
   2. Install valve with maximum depth to flow control handle not to exceed 12" below finish grade.
   3. Provide 1" clearance between pipe and valve box (cut and sand smooth valve box as required).
   4. Stabilize with leveling bricks.
   5. Install drainage backfill 6" minimum depth maintaining minimum 2" clearance below valve.
   6. Adjust automatic control valves to provide flow rate required for each sprinkler circuit.
   7. Adjust pressure regulator at control valves to provide required head pressure to each respective zone.
   8. Pressure at each control valve shall be verified and documented on Record Drawings.
   9. Install manual cut-off/isolation valve upstream of control valve and locate within valve box.
   10. Install ID tags at solenoid valve location to identify valve number and controller.

K. Manual Valves:
   1. Install manual valves in specified valve box.
   2. Stabilize with leveling bricks.
   3. Set top of valve box flush with grade.

L. Quick Coupler Valves:
   1. Install quick coupler valves flush with finish grade.
      a. Reinforce with stabilizer unit.

M. Wire:
   1. Install with 6 curl expansion curls at all valves.
   2. Place wire carefully in the controller box and all trenches.
   3. Snake wires in the trench to allow for expansion and contraction.
   4. Connect each valve to two wires.
      a. One wire shall be a station control valve power wire and shall not be smaller than No. 14, Type UF, and shall be a solid color (other than white).
      b. The second wire shall be a common wire from each controller to each of the valves served by each particular controller and shall not be smaller than No. 14, Type UF, with white insulation.
   5. Color coding is for identification purposes only.
   6. Install two (2) extra control wires from controller to the remote control valves located the greatest distances from the controller in all directions and label as spare wires.
      a. Run continuous and uncut wires through valve box at each control valve on run to most distant remote control valve.
      b. Provide a different color than the common and valve wires.
      c. Provide a minimum 6' length of wire coiled up in valve box.
   7. Contractor shall clearly and permanently label each end of the wires for section identification at the controller and section valve box.
   8. Install I.D. tags within valve box.

9. Wire splices are to be made only at the valves.
    a. When repairs or other situations require wire splices, at location other than at valves, all additional splices shall be placed in the same type box specified for remote valves.
    b. All splices other than at valve box must be brought to the attention of the Landscape Architect.
    c. Location to be recorded and dimensioned on as-built record drawing.
10. Tape wires at 10-foot intervals and place under main line.
11. Place wires under main line.
12. Enclose wire in grey Schedule 40 PVC conduit where control wire leaves main or lateral line trench.
13. Enclose wire in grey Schedule 40 PVC conduit from controller location to landscape area.
14. Submit proposed routing of all wiring to the Landscape Architect for review prior to installation.
15. Routing of all wiring is to be recorded on as-builts.

N. Piping:
1. Lay pipe on solid, sub base, uniformly sloped without humps or depressions. Do not lay pipe in water or mud.
2. Keep ends of pipe securely closed when work is not in operation to prevent water or other matter from entering lines.
3. Lay all pipe with material designations pointing up to accommodate visual verification.
4. Clean interior of pipe thoroughly and remove all dirt or foreign matter before lowering pipe into trench and keep clean during operation by plugs or other method.
    a. The ends of all pipe shall be reamed out full size.
    b. All off-sets shall be made with fittings.
    c. All water lines shall be thoroughly flushed out before the nozzles are installed.
5. Long runs of PVC pipe shall be snaked in the trench to allow for expansion and contraction.
6. Replace any pipe that is found to be defective.
7. Maintain minimum clearanceof 4 inches between parallel lateral lines and 6 inches between parallel lateral and main lines when installed in a common trench.
8. Elevation Change:
    a. Install inline check valves on laterals within irrigation zone when elevation change exceeds capacity of the respective sprinkler head's factory installed internal drain check valve.
    b. Place ball check valve in valve box used for remote control valves.
    c. Indicate location of check valves on as-built drawing of system.
9. Fittings:
    a. Install specified fittings for each type or class of pipe.
    b. Install all fittings a minimum distance of four (4) times pipe size from other fittings or equipment.
10. Metal Pipe:
    a. Protective plastic tape wrap all metal pipe installed below grade.
    b. Insulate all metal pipe installed above grade.
    c. Provide UV resistant insulation where exposure to direct sunlight may occur.

O. Penetrations:
1. At penetrations, through walls, building, foundation and etc., core drill for conduits size as required.
2. Pack the opening around pipe with non-shrink grout.
3. At interior and exterior face, leave a perimeter slot approximately 1/2-inch wide by 3/4-inch deep.
4. Fill this slot with backer rod and an acceptable elastomeric sealant.
5. Repair below grade waterproofing disturbed by this work and make penetration watertight.

P. Mainline piping beneath the structures:
   1. Buried piping beneath structure, install Schedule 40 PVC within Schedule 40 PVC sleeve 24" minimum below structure.
   2. Exposed, piping shall be Schedule 40 galvanized steel, unless indicated otherwise, hung from under floor of structure with galvanized steel pipe hangers to fully support weight of active piping to prohibit sagging and movement of pipe.
   3. Place hangers at 5' on center minimum.
   4. Place hangers at all changes in direction.
   5. Place manual valve on main line on each side of structure 5' from structure placed in valve box. Location may not be shown on plan.

Q. Temperature:
   1. Install PVC pipe in dry weather when temperature is above 40 degrees F (4 degrees C) in strict accordance with manufacturer's instructions.
   2. Allow joints to cure at least 24 hours at temperatures above 40 degrees F (4 degrees C) before testing, unless otherwise recommended by manufacturer.

R. Drain Pockets:
   1. Excavate to size required for valve box type or as indicated. Backfill with acceptable drainage material.
   2. Create envelope completely around drainage backfill material with a sheet of filter fabric and backfill remainder with excavated material.

S. Head Locations:
   1. Part Circle Spray Heads: Locate part-circle heads to maintain a minimum distance of 6 inches from walls and 4 inches from walks and other boundaries, unless otherwise indicated.
   2. Part Circle Rotary Heads: Locate part-circle rotary heads to maintain a minimum distance of 12 inches from building walls, 6 inches from walls, walks and other boundaries, unless otherwise indicated.
   3. Tree Bubbler Heads:
      a. Coordinate location of tree bubbler heads and laterals with Landscape Contractor.
         1) Make adjustments as may be required in field for installation of trees at no additional cost to Owner.
      b. Place bubblers on high-side of trees planted on slope condition.
   4. Install sprinkler heads equipped with check valves.
   5. Set all heads plumb vertically.

T. Dielectric Protection: Use dielectric fittings at connection where pipes and products of dissimilar metal are joined.

U. Weather Sensors:
   1. Install per detail on plans.
   2. Location is to be approved by Owner, Architect and Landscape Architect.
   3. Coordinate with other trades as required for installation of ½" diameter galvanized rigid metal conduit from controller to weather sensors.
   4. Securely fasten conduit to wall by means acceptable to Architect and Landscape Architect.

3.03 TEMPORARY IRRIGATION SYSTEM

A. Provide a temporary irrigation system for the establishment of landscape areas/surface vegetation not covered by the automatic irrigation system.
   1. Coordinate with requirements of the landscape contractor to provide and ensure the appropriate coverage for the establishment period of the landscape areas/surface vegetation.
   2. Submittal of shop drawing of design of temporary system for review by Landscape Architect is required.

B. Provide the temporary irrigation system as per the following:
   1. Utilize the new irrigation system distribution main line as the water source.

2. Locate supply points for the temporary system as deemed appropriate.
3. Control all supply points by schedule 80 PVC ball valves.
4. Install the ball valves below grade in the same valve boxes used for remote control valves.
5. Ball valves at the supply points must remain in place after temporary system is removed; provide dimensioned locations on record drawings. Place cap after ball valve when temporary irrigation is removed.
6. System operation: Operate manually or automatically as per the Contractor's discretion.
    a. Use schedule 80 PVC ball valves for the section control valves to be manually operated.
    b. Use of battery operated control valves to activate sections is at the discretion/option to of the Contractor.
7. Mainline and lateral piping: Class 200 solvent weld PVC pipe.
    a. Install all piping above ground. All piping is to be installed above grade.
    b. Stake and/or secure piping by appropriate means as to provide stabilization and to prevent any physical movement.
8. Utilize RainBird 2045 PJ Maxi-Bird impact rotary heads or equivalent at a spacing not to exceed the performance of the nozzle installed.
    a. At smaller areas, utilize RainBird PA-8S shrub adapter or equivalent with appropriate nozzle or equal on PVC riser.
    b. Maximum size of each temporary section shall be determined by the Contractor; zones shall not exceed total GPM flow of largest zone or total combined flow of linked sections of the automatic system as identified on plan.
9. Install the system so as not to throw any water onto the paved areas of roadways or parking lots.
10. Minimum water throwing into native areas will be acceptable.

C. Coordinate operation of the temporary irrigation system with the scheduling of the automatic irrigation system so as not to impede the performance of either system.

3.04 CLEAN UP

A. All ground surfaces where trenches have been cut will be leveled, debris removed; rubbish, materials of construction and equipment at the site shall be removed at the time of Final Inspection.

3.05 FINAL REVIEW

A. Notify the Landscape Architect, in writing, upon completion of the work and arrange for date of Final Review. Provide notice a minimum of 48 hours in advance of desired date of review.

B. Demonstrate to the Landscape Architect that all components of the entire system are operating properly and that all work has been completed in accordance with the plans and specifications. Refer to TESTS this section.

C. Prior to project turn over, the Irrigation Contractor will be required to conduct a final walk-thru with the Owner or their representative.
1. The walk-thru is to establish 100% completion of the irrigation system and operation according to specifications.
2. After three (3) malfunctions or installation discrepancies occur, the walk-thru will be stopped and rescheduled for a later date at the Contractors liability.

3.06 ITEMS TO BE FURNISHED

A. The Contractor shall provide as part of the work of this Section, the following:
1. Watering Schedule: The watering schedule includes the duration and frequency each irrigation zone will run per week and the resulting precipitation rate to be expected. This will be worked out jointly with the Landscape Contractor and shall be programmed on to the controller after review by the Landscape Architect. Produce a written seasonal watering schedule based on either current/real time evapotranspiration or monthly historical reference evapotranspiration (historical ET) data.

2. Two (2) service manuals for all equipment used shall be furnished to the Owner. Manuals may be loose-leaf and should show drawings or exploded views of equipment and catalog number and prices. Operating instructions for all equipment shall also be furnished.
3. Two (2) quick coupling keys with hose swivels of the proper size.
4. Four (4) pop-up spray heads of each type (standard and high-pop) and eight (8) nozzles of each type installed.
5. Four (4) rotary heads of each type installed and four (4) nozzles of each type installed.
6. Irrigation Installation Certification Letter: Letter of certification by Licensed Irrigator certifying the irrigation system was installed in accordance with the irrigation plan.

3.07 RECORD DRAWINGS

A. The Contractor shall keep up-to-date, a complete "as-built" record set of prints, corrected daily, showing any changes from the original plans.
   1. Prepare record drawings in accordance with the requirements of Section 01 78 00.
   2. Include field notes or taped dimensions that differ from the plan.
   3. Indicate dimensioned locations and depths below grade of all buried lines and equipment.
   4. Provide access to up-to-date record drawings at all times.
   5. Procure a set of the drawings from the Landscape Architect for this purpose.

B. Indicate on drawings:
   1. Location of wire routing indicating active, spare and future wires
   2. Location of all wire splice boxes
   3. Location of all sleeves.
   4. Locate all items listed above by triangulated dimensions from two (2) separate fixed reference points. Field verify all dimensions prior to submittal for final payment.

C. Provide the Landscape Architect with the "As Built" record drawings of changes to the work upon completion of the Project.
   1. The changes shall be recorded in a legible and workman-like manner.
   2. Provide on a reproducible medium.
   3. Provide electronic file in PDF format.
   4. Provide electronic CAD file, version AutoCAD 2002.

3.08 SYSTEM INSTRUCTIONS

A. Zone Map:
   1. Furnish to the Landscape Architect a drawing at 50 percent reduced scale of the overall plan image and valve schedule of the installed system showing the areas controlled by each controller identifying the location of the valves and station number assigned to each.
   2. Drawing shall indicate color coded area of coverage per each zone and location of supply main and taps.
   3. Colors to be coordinated and shown on the valve schedule.
   4. Charts must be completed and approved prior to final inspection of the irrigation system.

B. Instruction Session:
   1. After the system has been completed, inspected and approved, conduct a training session for the Owner's maintenance personnel in the operation and general maintenance of the irrigation system.

C. This will also include a review of the manuals to be furnished to the Owner as called for elsewhere in these specifications and field demonstrations of system components assembly and maintenance.

3.09 GUARANTEE

A. The entire sprinkler system shall be guaranteed by the Contractor as to materials and workmanship, including settling of backfilled areas below grade for a period of one (1) year following date of final acceptance of the work.

B. Should any operational difficulties in connection with the irrigation system develop within the specified guarantee period, which, in the opinion of the Landscape Architect or Owner may be due to inferior material and/or workmanship, said difficulties shall immediately be corrected by the Contractor to the satisfaction of the Owner, at no additional cost.

3.10 MAINTENANCE

A. During the first year after acceptance of the system, repair breaks and malfunctions which occur including all materials and labor, at no additional cost to the Owner.

B. If replacement equipment should fail during the succeeding eight months, provide additional replacement materials.

C. **Within the warranty period, replace disturbed or misaligned temporary irrigation lines. At the Owners request, remove all above ground temporary irrigation and dispose of as directed.**

3.11 TEMPORARY REPAIRS

A. The Owner reserves the right to make temporary repairs as necessary to keep the sprinkler system equipment in operating condition.

B. The exercise of this right by the Owner shall not relieve the Contractor of his responsibility under the terms of the guarantee as herein specified.

END OF SECTION

SECTION 32 9113

SOIL PREPARATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Topsoil/planting soil placement and finish grading for landscape work.

B. Extent of soil preparation work as addresses entire site.

C. Refer to Earthwork section. Subcontractors shall coordinate with General Contractor on responsibility for earthwork.

D. Subgrade Elevations: Excavation, filling and grading are not specified in this section.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A.	Earthwork/Grading	Refer to Civil Sections
B.	Landscape Irrigation System	Section 32 8442
C.	Seeding	Section 32 9219
D.	Sodding	Section 32 9223
E.	Landscape Maintenance	Section 32 9310
F.	Treatment of Existing Trees	Section 31 1330

1.03 SITE CONDITIONS

A. Verification of Dimensions:
   1. All scaled and figured dimensions are given for estimate purposes only.
   2. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and sizes, etc., and shall assume full responsibility for the correctness of all such items.

B. Existing Conditions:
   1. New work shall be tied to existing conditions and controls such as existing grades.
   2. Finished grades shall bear proper relationship to such controls.

C. The Contractor shall adjust new work as necessary and as directed to meet existing conditions and fulfill intent of the plans.

D. Obstructions: If any unknown utilities and obstacles are encountered during the construction period, stop work and immediately contact the Landscape Architect before proceeding.
   1. Such obstructions shall be removed or relocated or the work adjusted as directed by the Landscape Architect.
   2. If work proceeds without contacting the Landscape Architect, the Contractor shall be held liable for any and all damages.

E. Underground Utilities:
   1. Prior to initiating any work of this section, the Contractor shall contact the appropriate authorities in order that their personnel can locate existing underground utilities that may be encountered.
   2. Coordinate with other trades on project concerning installation of new utilities that may be affected.

F. Existing Vegetation:
   1. Portions of the existing vegetation shall remain as indicated on the drawings.
   2. The Contractor shall take all means necessary to protect the existing vegetation. Any existing vegetation to remain that is damaged shall be replaced.

G. Subgrade Elevations:
   1. Excavation, filling and grading required to establish elevations shown on drawings are not specified in this section.
   2. Subgrade elevations shall be established prior to placement of landscape soils to allow for placement to depths as indicated/required.

1.04 QUALITY ASSURANCE

A. Landscape installation or maintenance must be supervised by a staff member of the Contractor who possesses at least one of the following current certifications/designations:
   1. Certified Landscape Professional Contractor (CLPC) as administered by Texas Association of Landscape Contractors (TALC).

B. It is the obligation of the bidder to provide the Owner or Landscape Architect with documentation that the above qualification is met.

1.05 SOURCE QUALITY CONTROL

A. Analysis and Standards:
   1. Package standard products:
      a. Packaged and sealed standard products accompanied by manufacturer's or vendors' analysis, complying with specification requirements, will be acceptable.
   2. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agricultural Chemists, wherever applicable.

B. Presence of Non-specified Grasses and Weeds:
   1. The Landscape Architect reserves the right to inspect landscape areas from time of installation to Final Acceptance.
   2. Any evidence of non-specified grasses or weeds will be cause for rejection and replacement of the unacceptable areas.

1.06 SUBMITTALS

A. Furnish at Landscape Architect's office, prior to installation, the following information/samples:
   1. Supervisor Qualifications.
   2. Soil Conditioner: Product Label (Supplier's statement of analysis if bulk), and one ounce sample.
   3. Herbicide: Product Label from container or Supplier's brochure.

B. Furnish at Landscape Architect's office, prior to close-out of Project, the following:
   1. Proof of Compliance with Specifications
      a. Demonstrate compliance by providing invoices to prove purchase of all products in sufficient quantity to cover the project at the rates recommended by the manufacturer or as specified. Include project name, date of purchase of product and name of contact.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packaged Materials:
   1. Deliver packaged materials in original containers showing weight, analysis and name of manufacturer.
   2. Protect materials from deterioration during delivery, and while stored at site.

1.08 ABBREVIATIONS

A. C.Y Cubic Yard

B. S.Y. Square Yard

C. S.F. Square Feet

D. L.F. Linear Feet

1.09 JOB CONDITIONS

A. Basic Regulations:
   1. Soil preparation operations shall be conducted under favorable weather conditions during the seasons which are normal for such work as determined by acceptable practice in the locality.

B. Contractor is hereby notified of active utilities and caution shall be exercised to avoid interruption of services.

C. The Contractor is responsible for replacement of any existing buried utilities, irrigation lines, etc., if they are broken during the soil preparation operations.
   1. Contact the appropriate utility to get the locations of underground utilities.
   2. The replacement costs are at the Contractor's expense.

D. When it is necessary to cross paved areas, curbing or walks, protection against damage shall be provided by the Contractor.

E. When conditions detrimental to landscape work are encountered during soil preparation, such as rubble fill, adverse drainage conditions, or obstructions, notify Landscape Architect before initiating work.
   1. Such obstructions shall be removed or relocated or the work adjusted as directed by the Landscape Architect.
   2. If work proceeds without contacting the Landscape Architect, the Contractor shall be held liable for any and all revisions neccessary.

1.10 WARRANTY & GUARANTEES

A. Repair:
   1. When any portion of the surface becomes gullied or otherwise damaged or treatment is destroyed during the Project's warranty period, the affected portion shall be repaired to reestablish condition and grade of soil to as it was prior to injury as directed.
   2. Repair work required shall be performed without cost to the Owner.

B. Repair shall be made within 10 days of notification or as soon as weather conditions are satisfactory.

PART 2 - PRODUCTS

2.01 SOIL ADDITIVES

A. Soil Conditioner: Compost, composted for a period of eight (8) weeks or longer, organic, derived from animal manure, wood shavings, hay, seed hulls, stable bedding, or other organic residue, without dust, objectionable odors, viable weed seed; aerobic and friable.
   1. A maximum of 10% cedar flakes/shavings is allowed in conditioner.

2.02 MISCELLANEOUS

A. Post-Emergence Herbicide: Round-Up by Monsanto Corp., or approved equal.

B. Drainage Fill: Cleaned/washed gravel or crushed stone graded from 1-inch maximum to 3/8-inch minimum.

PART 3 - EXECUTION

3.01 WEED TREATMENT

A. All site locations to receive planting where weeds exist, shall be treated with post-emergent herbicide.
   1. Repeat treatment as required that no weeds are present at the beginning of work on the landscape planting of the Project.

B. No weeds shall be present at the date of inspection for Substantial Completion of the Project and at the conclusion of the maintenance and establishment period following acceptance of the Contractor's work.

C. Post-emergent weed treatment includes:
   1. Removal of weeds and other undesirable ground cover vegetation in turf/grass and planting areas shall be accomplished a minimum of 14 days prior to soil preparation for planting operations.
   2. Care shall be taken not to affect existing trees or shrubs to be saved on the site.
   3. Care shall be taken to not affect plants on adjacent site.

3.02 WEED TREATMENT PROCEDURE

A. Mow grass and/or existing weeds to 3-inch height.

B. Spray herbicide on a day that is not rainy, not windy and adequately warm.
   1. Within 24 hours of cutting grass/weeds.

C. Do not disturb soil for 14 days. If live, green weeds remain, repeat as required to kill all weeds, before disturbing soil.

D. After 14 days, scalp and mechanically rake soil when the soil is not excessively hard or dry (water the soil if necessary) to remove 85% of dead foliage above grade.

E. The remaining dead material shall be allowed to accumulate in place and shall be incorporated into the soil through the rototilling of the soil preparation work.

3.03 SOIL PREPARATION FOR ENTIRE SITE

A. Areas disturbed by new construction and grading.

B. Excavate/coordinate subgrade elevation to accommodate placement of the specified soil types.

C. The Contractor is to report immediately upon his awareness, any site condition or situation of the contiguous landscape that would cause flooding, washing or concentration of excess surface water to the areas receiving planting or turf /grass.

D. Irrigation work shall be completed after herbicide spraying, scalping and removal of vegetative debris and rough grading, but prior to finish grading.

E. Prior to placement of the specified soil type, cultivate subgrade to a minimum of 4 inches. Remove stones over 2-inch diameter and sticks, roots, rubbish and other extraneous debris of any dimension.

F. Regrade site as required, if disturbed by weed removal, for positive drainage.

G. The site shall be free from irregular surface changes and shall vary uniformly between fixed elevations.

H. Refer to RECONDITIONING SITE in this section for treatment of turf/grass areas beyond those disturbed by grading associated with project.

3.04 SOIL PLACEMENT

A. The Contractor is to report immediately upon his awareness, any site condition or situation of the contiguous landscape that would cause flooding, washing or concentration of excess surface water to the planting areas.

B. Complete irrigation work prior to finish grading.

C. Confirm establishment of subgrade elevations to achieve positive drainage after placemnt of soil and completion of finish grading.

D. Depth placement (compacted) schedule:
   1. Turf/Grass Area:
      a. 6 inch depth.

E. Fine grade planting areas to smooth, even surface with loose, uniformly fine texture.
   1. Roll, rake and drag planting areas, remove ridges and fill depressions, as required to meet finish grade.
      a. Tolerance at 1/2 inch variance from a plane line within turf areas established by two points at a distance of 20' (utilizing string line or 2 X 4).
   2. Compact the entire area to a maximum dry density not less than 80 percent and not more than 85 percent.
   3. Limit fine grading to areas which can be planted immediately after grading.
   4. Allow for grass thickness in areas to be sodded or seeded. Finish grade of soil shall be:
      a. 1-1/2 inches below top of pavement in sodded areas.
      b. 1 inch below top of pavement in areas to be seeded.

3.05 SEED/SOD BED PREPARATION

A. Protection:
   1. Take care and preparation in work to avoid conditions which will create hazards. Post signs or barriers as required.
   2. Provide adequate means for protection from damage through excessive erosion, flooding, heavy rains, etc. Repair or replace damaged areas.
   3. Keep site well drained and landscape excavations dry.

B. Surface Preparation:
   1. Seven days maximum prior to turf installation:
   2. In areas where topsoil will not be placed (e.g. areas not disturbed by grading), loosen area 4 inches deep, dampen thoroughly, and cultivate to properly break up clods and lumps.
      a. Place and incorporate by tilling a 2" layer of soil conditioner over entire area.
   3. Coordinate with general cultivation required of overall area as required/specified by civil work.
   4. Rake area to remove clods, rocks, weeds, roots, and debris.

C. Grade and shape area to receive turf/grass to bring surface to true uniform planes free from irregularities and to provide drainage and proper slope to catch basins.

D. After turf/grass areas have been prepared, take no heavy objects over them except turf/grass rollers.

E. After preparation of turf/grass areas and with top soil in semi-dry condition, roll planting areas in two directions at approximately right angles with water ballast roller weighing 100 to 300 lbs according to soil type.

F. Rake or scarify and cut or fill irregularities that develop as required until area is true and uniform, free from lumps, depressions, and irregularities.

3.06 UNDER EXISTING TREES

A. Soil preparation under existing trees includes the removal by hand of surface vegetation not to remain.

B. Herbicide shall not be used.

C. Existing soil shall be amended as indicated in RECONDITIONING SITE.

D. Existing soil shall be amended as per the recommendations of the soils analysis in grass/turf areas.

3.07 PLANTING AREA DRAINAGE

A. Place drain line and drainage fill encased in soil separation fabric along bottom of retaining/planter wall; fill with planting area with soil as specified.

B. Place soil in 6-inch lifts and compact to 85%-90% maximum dry density to an elevation of 1-1/2 inches below top of retaining/planter wall. Provide additional soil mix as required for settlement.

3.08 RECONDITIONING SITE

A. Recondition any existing turf/grass areas damaged by Contractor's operations including storage of materials and equipment and movement of vehicles.

B. Includes conditioning of areas not damaged by construction or disturbed by grading that are indicated to receive new landscape treatment.

C. Recondition site locations by incorporating a minimum of 2 inches of soil amendment without changing the elevation of the soil contiguous to curbs and sidewalks, beneath canopies of trees and other fixed features.

D. The following paragraphs describe the process sequence for preparation of the soils prior to the turf/grass planting including herbiciding, excavation and placement.
   1. The entire area to receive soil conditioner to be reconditioned shall be treated to kill weeds; weeds shall be completely dead.

2. The entire area to receive soil amendment to be reconditioned shall be treated to kill weeds; weeds shall be completely dead.
3. The weed treatment shall be inspected and approved by the Landscape Architect prior to beginning this work. See WEED TREATMENT this section.
4. If rainfall has not been sufficient to loosen soil, the entire area shall be watered beginning a minimum of one week prior to cultivating operation and continued until enough moisture is present to enable cultivating.
5. Cultivate or rototill the entire area where turf/grass is to be reconditioned to a minimum 4-inch depth.
    a. Remove rocks and debris.
    b. Compact to a maximum dry density not less than 80 percent and not more than 85 percent.
    c. Work within dripline of trees to be done by hand.

E. Remove diseased and unsatisfactory turf/grass areas; do not bury into soil.
1. Remove topsoil containing foreign materials resulting from Contractor's operations including oil drippings, stone, gravel and other loose building materials.
2. Replace with approved topsoil as required.

F. Excavate 2 inches of the existing soil contiguous to the walks, curbs, and other site improvements. Taper the excavation to meet existing grade 15 feet away from the beginning edge.
1. Where existing trees are within the area to be excavated and tapered and when existing grade is below the elevation of the walk, wall or etc., being tapered away from, the soil around the tree roots shall be loosened to a depth of 3 inches being careful not to damage roots.
2. When existing grade is at or above the elevation of walk, wall or etc., being tapered away from, the soil around the tree roots shall be loosened and removed to a depth corresponding to the depth of taper where the tree is, being careful not to damage roots.
3. This work shall be done by hand if necessary to protect the tree roots.

G. Excavated soil may be deposited within the turf/grass areas spread smooth and tapered to existing grades to follow existing drainage patterns.
1. No area shall receive more than a 3-inch depth of re deposited excavated soil at its deepest point.
2. When existing trees occur within an area where excavated soils are being spread no excavated soil shall be spread inside of the dripline of the trees.

H. Soil shall not be deposited in a manner which creates ponding in any area.

I. When excavation and redistribution of excavated soil is complete, a minimum of 2 inches of soil conditioner shall be placed over the entire area to receive soil preparation.

J. When excavation and redistribution of excavated soil is complete, a minimum of 2 inches of soil amendment shall be placed over the entire area to receive soil preparation.

K. Irrigation work shall be completed after rototilling and compaction but prior to finish grading.

L. After the irrigation system is in place, the entire area shall be raked smooth removing all rocks, roots and debris 1 inch in diameter or larger.

M. The site shall be free from irregular surface changes and shall vary uniformly between fixed elevations.

N. Finish grading shall be one and a half (1-1/2) inches in sodded areas and one (1) inch in seeded areas below the top of concrete walks and other site features affected by grade.
1. The site shall be ready for grass planting, inspected and approved by the Landscape Architect.

3.09 CLEANUP AND PROTECTION

A. During soil preparation work, all rocks, clods and other debris, shall be removed daily and the site kept neat at all times.

B. Any excess excavated subsoil or topsoil shall be removed from the site.

C. After soil preparation operations are finished, all paved areas which may have become strewn with soil or other material shall be thoroughly cleaned by sweeping, and if necessary, power washing.

3.10 INSPECTION AND ACCEPTANCE

A. When soil preparation is completed, Landscape Architect will, upon written request by the Contractor, make an inspection to determine acceptability.

B. Review of the soil preparation is required prior to initiating any planting work; work will not be accepted otherwise.

C. When soil preparation is completed, Landscape Architect will, upon request by the Contractor, take an inspection to determine acceptability.

D. Where inspected soil preparation work does not comply with requirements, replace rejected work until reinspected by the Landscape Architect and found to be acceptable.

END OF SECTION

SECTION 32 9219

SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Seeding or hydroseeding; mulching and fertilizer.

B. Maintenance.

1.02 RELATED REQUIREMENTS

A. Grading - Refer to Civil.

B. Section 31 2323 - Fill: Topsoil material.

C. Section 32 9310 - Landscape Maintenance.

1.03 DEFINITIONS

A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.04 SUBMITTALS

A. Products:
   1. Mulching Agent.
   2. Certification of seed.

1.05 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for fertilizer and herbicide composition.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

A. Refer to section 02935 for duration of maintenance period.

PART 2 PRODUCTS

2.01 SEED MIXTURE

A. Seed Mixture:
   1. Grass Seed: Provide fresh, clean, new crop seed complying with tolerance for purity and germination established by the U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act and the Texas Seed Law.
      a. Seed which has become wet, moldy or otherwise damaged in transition in storage will not be accepted.
      b. Seed to be completely free of any objectionable foreign material that will hinder proper distribution.
      c. Seed to be treated with an approved fungicide by commercial or state laboratory not more than 6 months prior to date of planting.
      d. Seed rate to be Pure Live Seed (PLS). Minimum percent of PLS to be 85%. Seed type to be planted at the mixture, rate and planting conditions as follows:
         1) Black Jack bermudagrass warm season grass) - 2 pounds per 1000 square feet- March 20 to September 1.

2.02 ACCESSORIES

A. Mulching Agent: Weyerhauser virgin wood fiber mulch, Silva Fiber distributed by James Lincoln Corp., Garland, Texas 972/840-2440 or approved equal.

B. Starter Fertilizer: 13-13-13 water soluble fertilizer.

C. Fertilizer and Amendments:
   1. Fertilizer: Soil Food, 6-2-2, manufactured by Gardenville, 210-651-6115.
   2. Biostimulant: Agri-Gro, manufactured by Agri-Gro Marketing, Inc., distributed by Gardenville, 210-651-6115.

D. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

E. Erosion Control Fabric: Utilize the following erosion control blankets as manufactured by North American Green, available through Contractor's Source, Inc. (800) 256-2200 or approved equal:
   1. Type-1: DS75-straw erosion control blanket with lightweight netting.
   2. Type-2: SC150-70% straw and 30% coconut fiber matrix with heavy weight netting.

F. Herbicide:
   1. Post Emergent Herbicide (spot treatment): Round-Up by Monsanto Corp. or approved equal.
   2. Selective Herbicide: Certainty by Monsanto Corp., or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this Section.

3.02 PREPARATION

A. Subgrading - Refer to Civil.

B. Topsoil - Refer to Civil.

3.03 HYDROMULCH SEEDING APPLICATION

A. Apply hydromulch slurry with a hydraulic seeder at rate of 45 pounds per 1000 square feet mulching agent and 7.6 pounds per 1000 square feet starter fertilizer.
   1. Include seed at rate noted.

B. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

C. Maintain watering as required to establish grass.

3.04 FERTILIZING

A. Fertilizer:
   1. Apply fertilizer in accordance with manufacturer's instructions.
      a. Application rate to provide 1# nitrogen per 1000 square feet.
   2. Apply after smooth raking of topsoil and prior to roller compaction.
   3. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
   4. Do not fertilize native grass and wildflower areas.

B. Mix thoroughly into upper 2 inches of topsoil.

C. Biostimulant:
   1. Apply biostimulant at rate in accordance with manufacturer's instructions.
      a. Turf/Grass: 2 oz s. of concentrate per 1000 s.f.
      b. Native Grass and Wildflower Areas: 1 qt. concentrate per acre.
   2. Apply over areas after seeding is completed. Water in.

3.05 SEEDING

A. Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.

B. Seed all areas disturbed as a result of construction operations.

C. The period October 1 to march 1 is not considered suitable for seeding bermudagrass. During this period the soil will be stabilized by one seeding of cool season seed. After May 15 the area seeded with the cool season grass mix is to be reseeded with the common bermudagrass after preparation.
   1. Rye grass is to be closely mowed and be allowed to be burn out. After the temporary grass is dead, the area is to be lightly scarified and overseeded with bermudagrass and reestablished prior to acceptance by the Owner.

D. Refer to HYDROMULCH SEEDING for work to be completed.

E. Apply water with a fine spray immediately after each area has been seeded. Saturate to 4 inches depth of soil. Maintain moisture level as required to germinate and establish.

F. Following germination, immediately re-seed areas without germinated seeds that are larger than 12 x 12 inches.

3.06 HYDROMULCH SEEDING APPLICATION

A. Apply hydromulch slurry with a hydraulic seeder at rate of 45 pounds per 1000 square feet mulching agent and 7.6 pounds per 1000 square feet starter fertilizer.
   1. Include seed at rate noted.

B. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

C. Maintain watering as required to establish grass.

3.07 PROTECTION

A. Cover seeded slopes where grade is 3:1 inches per foot; or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.
   1. Utilize DS75 (Type 1) matting at locations adjacent run-off is over landscape area.
   2. Utilize SC150 (Type 2) matting at locations adjacent run off is over paved surface (e.g. parking lot or street).

B. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Provide 12 inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.

C. Lay blanket smoothly on surface, bury top end of each section and overlap adjacent rolls per manufacturer's instructions. Backfill trench and rake smooth, level with adjacent soil.

D. Secure outside edges and overlaps at 36 inch intervals with stakes.

E. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

F. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

3.08 MAINTENANCE

A. Begin maintenance immediately after seeding. Maintenance shall continue until final acceptance of the project. Refer to Section 32 9310 - Landscape Maintenance.

B. Water to prevent grass and soil from drying out.

C. Roll surface to remove minor depressions or irregularities.

D. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.
   1. Use only post emergent herbicide for spot treatment in native grass and wildflower areas.

E. Immediately reseed areas which show bare areas.

3.09 CLEAN UP AND PROTECTION

A. After seeding operations are finished, all paved areas shall be thoroughly cleaned by sweeping, and if necessary power washing.

B. Protect seeded areas with warning signs during maintenance period.

END OF SECTION

SECTION 32 9223
SODDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fertilizing.

B. Sod installation.

C. Maintenance.

1.02 RELATED REQUIREMENTS

A. Grading - Refer to Civil.

B. Section 31 2323 - Fill: Topsoil material.

C. Section 32 9310 - Landscape Maintenance.

1.03 REFERENCE STANDARDS

A. TPI (SPEC) - Guideline Specifications to Turfgrass Sodding; Turfgrass Producers International; 2006.

1.04 SUBMITTALS

A. See Section 01330 for submittal procedures.

B. Certification: Submit certification of grass species and location of sod source.

1.05 QUALITY ASSURANCE

A. Sod Producer: Company specializing in sod production and harvesting with minimum five years experience, and certified by the State of Texas.

B. Installer Qualifications: Company approved by the sod producer.

1.06 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for fertilizer and herbicide composition.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver sod on pallets or in rolls. Protect exposed roots from dehydration.

B. Do not deliver more sod than can be laid within 24 hours.

A. Refer to Section 32 9310 for duration of maintenance period.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sod: TPI, Certified Turfgrass Sod; Approved Turfgrass Sod; Nursery Turf grass Sod; cultivated grass sod; type indicated below; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft. Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.

1. Tifway 419 Bermudagrass, Cynodon dactylon 'Tifway 419'; Grass Type: 100 percent.

B. Fertilizer and Amendments: Refer to Section- 02921.

C. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

2.02 ACCESSORIES

A. Reinforcing Mat: Thermally welded PVC monofilament, non-biodegradable, non-toxic, UV stabilized, weight 1.75 pounds per square yard, specific gravity of 1.37, PEC-MAT by Greenstreak, distributed by American Excelsior Co., Arlington, Texas, 1-800-777-7645.

B. Sand and compost soil mix, screened, manufactured by New Earth, LLC (210) 661-5180 or Gardenville (210) 651-6115.

C. Wood Pegs: Softwood, sufficient size and length to ensure anchorage of sod on slope.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this section.

3.02 PREPARATION

A. Grading / subgrade / topsoil - Refer to Civil.

B. Install edging at periphery of seeded areas in straight lines to consistent depth.

3.03 FERTILIZING

A. Fertilizer:
   1. Apply fertilizer at rate to apply 1 pound nitrogen per 1000 square feet.
   2. Apply after smooth raking of topsoil and prior to installation of sod.
   3. Apply lawn fertilizer no more than 48 hours before laying sod.
   4. Lightly water to aid the dissipation of fertilizer.
      a. Biostimulant:
         1) Apply biostimulant at rate in accordance with manufacturer's instructions.
         2) Turf/Lawn: 2 oz s. concentrate per 1000 s.f.
         3) Apply over areas after sodding is completed. Water in.

3.04 LAYING SOD

A. Moisten prepared surface immediately prior to laying sod.

B. Lay sod immediately after delivery to site; within 24 hours after harvesting to prevent deterioration.

C. Lay sod smooth and tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.

D. Place top elevation of sod mat 1/2 inch; 1 inch below adjoining edging; paving and curbs.

E. Within swales and on side slopes, lay sod perpendicular to slope and swales and secure every row with wooden pegs at maximum 2' on center. Drive pegs flush with soil portion of sod.

F. On slopes 6 inches per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at maximum 2 feet on center. Drive pegs flush with soil portion of sod.

G. Prior to placing sod, on slopes exceeding 8 inches per foot , place reinforcing mat over topsoil. Securely anchor in place with wood pegs sunk firmly into the ground.

H. Water sodded areas immediately after installation. Saturate sod to 4 inches of soil.

I. After sod and soil have dried, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities. Roll sodded areas with roller not exceeding 100-150 lbs.per lineal foot of roller.

3.05 MAINTENANCE

A. Begin maintenance immediately after sodding. Maintenance shall continue until final acceptance of the project. Refer to Section 32 9310 - Landscape Maintenance.

B. See Section 32 9310 - Landscape Maintenance for post-occupancy maintenance.

C. Water for grass establishment to prevent grass and soil from drying out.

D. Roll surface to remove irregularities.

E. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.

F. Immediately replace sod to areas that show deterioration or bare spots.

3.06 CLEAN-UP PROTECTION

A. After sodding operations are finished, pick-up debris and thoroughly clean all paved areas by sweeping, and if necessary, by power washing.

B. Protect sodded areas with warning signs during maintenance period.

END OF SECTION

SECTION 32 9300

EXTERIOR PLANTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Extent of landscape work is shown on drawings and in schedules.

B. Subgrade Elevations:
   1. Excavation, filling and grading required to establish elevations shown on drawings are not specified in this section; refer to Earthwork sections.
   2. Subcontractors shall coordinate with General Contractor on responsibility for earthwork.

C. Finish Grade Elevations: Work to establish finish grades is not specified in this section; refer to Section - Soil Preparation.

1.02 RELATED REQUIREMENTS

A. Section 01330 - Submittals

B. Section 32 84 42 - Landscape Irrigation System

C. Section 32 91 13 - Soil Preparation

D. Section 32 92 19 - Seeding

E. Section 32 92 23 - Sodding

F. Section 32 93 10 - Landscape Maintenance

G. Section 31 1330 - Treatment of Existing Trees

1.03 SITE CONDITIONS

A. Verification of Dimensions: Refer to Section 32 91 13, Soil Preparation.

B. Existing Conditions: Refer to Section 32 91 13, Soil Preparation.

C. Obstructions: Refer to Section 32 91 13, Soil Preparation.

D. Underground Utilities: Refer to Section 32 91 13, Soil Preparation.

E. Existing Vegetation: Refer to Section 32 91 13, Soil Preparation.

1.04 QUALITY ASSURANCE

A. Supervisor Qualifications: Refer to Section 32 91 13 - Soil Preparation, for qualifications of Supervisor of landscape work.

1.05 SOURCE QUALITY CONTROL

A. General: Planting materials shall meet or exceed the Specifications of Federal, State and local laws requiring inspection for plant disease and insect control.

B. Plant material shall conform to the following documents which are to be considered part of these Specifications:
   1. "Standardized Plant Names," American Joint Committee on Horticultural Nomenclature, latest edition.
      a. Names of varieties not listed conform generally with names accepted by the nursery trade.
      b. Provide stock true to botanical name and legibly tagged.
   2. "American Standard for Nursery Stock," American Association of Nurserymen, Inc., latest edition. A plant shall be dimensioned as it stands in its natural position.
   3. "Grades and Standards for Nursery Stock," Texas Association of Nurserymen.
   4. All plants shall be nursery grown under climatic conditions similar to those in the locality of the project.

C. Stock furnished shall be at least the minimum size indicated.
   1. Larger stock is acceptable, at no additional cost and providing that the larger plants will not be cut back to size indicated.

2. Provide plants indicated by two measurements so that only a maximum of 25% are of the minimum size indicated and 75% are of the maximum size indicated.
3. Stock indicated as only "container" without container size indicated, provide containerized stock sized as needed to attain or exceed the measurements specified.

D. Provide "specimen" plants with a special height, shape or character of growth.
1. Tag specimen trees or shrubs at the source of supply.
2. At Landscape Architect's discretion, Landscape Architect may inspect specimen selections at the source of supply for suitability and adaptability to selected location.
3. When specimen plants cannot be purchased locally or when requested by Landscape Architect, provide sufficient photographs or video of the proposed specimen plants for approval.
4. Contractor shall provide written notice of request for inspection to the Landscape Architect a minimum of two (2) weeks prior to date of inspection.
5. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of the work.

E. Plants may be inspected and approved at the place of growth for compliance with specification requirements for quality, size and variety.
1. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of the work.

F. Analysis and Standards:
1. Package standard products with manufacturer's certified analysis.
2. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agricultural Chemists, wherever applicable.

G. Label at least one plant of each variety in each delivery with a securely attached waterproof tag bearing legible designation of botanical and common name.
1. Same species with different flower color varieties shall have a label on each plant.

H. Inspections:
1. All necessary state, federal, and other inspection certificates shall accompany the invoice for each shipment or order for plant materials as may be required by law.
2. All plants shall be subject to inspection and approval at the site or elsewhere.
3. The Landscape Architect reserves the right to reject, at any time or place, prior to final acceptance of the work, any or all of the plants which fail to meet requirements of these specifications.

I. Trees, shrubs, perennials and annuals that are undersized or in poor and un viable condition, if planted, shall not be accepted and must be replaced to accomplish the landscape contract.

J. Conditions where the site is left at an irregular grade are not acceptable.

1.06 EXPLANATION OF DRAWINGS

A. Due to the scale of drawings, it is not possible to indicate all conditions affecting work.
1. The Contractor shall carefully investigate the structural and finished conditions affecting all of his work and plan his work accordingly, furnishing such elements as may be required to meet such conditions.
2. Drawings are generally diagrammatic and indicative of the work to be installed.
3. The work shall be installed in such a manner as to avoid conflicts between irrigation systems, existing planting and trees and other construction on site.

B. All work called for on the drawings by notes or details shall be furnished and installed whether or not specifically mentioned in the specifications.

C. The Contractor shall not willfully install the planting as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in area dimensions exist that might not have been considered in design.
1. Such obstructions or differences should be brought to the attention of the Owner's authorized representative and Landscape Architect.

2. In the event this notification is not performed, the contractor shall assume full responsibility for any revisions necessary.
3. Contractor shall be responsible for all costs involved with work.

1.07 SUBMITTALS

A. Furnish at Landscape Architect's office, prior to installation, the following information/samples:
   1. Supervisor Qualifications.
   2. Soil Conditioner: Label from bag (Supplier's statement of analysis if bulk), and one ounce sample.
   3. Mulch: Label from bag (Supplier's statement of analysis if bulk), and 1-gallon container of mulch sample.
   4. Fertilizer: Label from bag or Supplier's brochure.
   5. Mycchorizal Fungi Treatment: Label from container or Supplier's brochure.
   6. Herbicide: Label from container or Supplier's brochure.
   7. Edging: Sample minimum 12" length.
   8. Aggregates: 1-pound sample.
   9. Drainage Fill: 1-pound sample.
   10. Decomposed Granite: One (1) quart container.
   11. Soil Separation Fabric: Suppliers brochure and 12" x 12" section of fabric.
   12. Plant Schedule: Indicate quantities and species of plant material, with complete source information (nursery name, address, phone number).
      a. Photos of specimen plant materials.

B. Furnish at Landscape Architect's office, prior to close-out of Project, the following:
   1. Proof of Compliance with Specifications
      a. Demonstrate compliance by providing invoices to prove purchase of all products in sufficient quantity to cover the project at the rates recommended by the manufacturer or as specified. Include project name, date of purchase of product and name of contact.

1.08 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packaged Materials:
   1. Deliver packaged materials in original containers showing weight, analysis and name of manufacturer.
   2. Protect materials from deterioration during delivery, and while stored at site.

B. Trees and Shrubs:
   1. Do not prune prior to delivery unless otherwise approved by Landscape Architect.
   2. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches or destroy natural shape.
   3. Provide protective covering during delivery to prevent wind burn.
   4. Spray deciduous plants in foliage with approved anti-desiccant immediately after digging to prevent dehydration.

C. Deliver plant materials after preparations for planting have been completed and plant immediately.
   1. Protect all plants from drying out.
   2. Use all means necessary to protect plant materials before, during and after installation and to protect the installed work and materials of all other trades.

D. Do not remove container grown stock from containers until planting time. Do not drop stock during delivery; broken and loose balls shall not be accepted.

1.09 ABBREVIATIONS

A. B&B- Balled & Burlapped

B. GAL.- Gallon Container Size as Indicated

C. M.T.- Multi-Trunk

D. O.C.- On Center

E. S.Y.- Square Yard

F. S.F.- Square Feet

G. CAL.- Caliper

H. L.F.- Linear Feet

I. T.F.- Tree-form

J. HT.- Height

K. SPR.- Spread

1.10 JOB CONDITIONS

A. Basic Regulations:

1. Planting operations shall be conducted under favorable weather conditions during the seasons which are normal for such work as determined by acceptable practice in the locality.
2. Contractor is hereby notified of active utilities and caution shall be exercised to avoid interruption of services.
3. The Contractor is responsible for replacement of any buried utilities, irrigation lines, etc., if they are broken during the planting operations.
4. It is recommended that he contact the appropriate utility to get the locations of underground utilities. The replacement costs are at the Contractor's expense.
5. When it is necessary to cross paved areas, curbing or walks, protection against damage shall be provided by the Contractor.
6. When conditions detrimental to plant growth are encountered during soil preparation or planting, such as rubble fill, adverse drainage conditions, or obstructions, notify Landscape Architect before planting.
    a. Such obstructions shall be removed or relocated or the work adjusted as directed by the Landscape Architect.
    b. If work proceeds without contacting the Landscape Architect, the Contractor shall be held liable for any and all revisions neccessary.

B. Work Sequence:

1. Plant trees and shrubs after final grades are established and prior to planting of turf, unless otherwise acceptable to Landscape Architect.
2. If planting of trees and shrubs occurs after turf work, protect turf areas and promptly repair damage to turf resulting from planting operations.

1.11 WARRANTY & GUARANTEES

A. TREE, SHRUB AND GROUNDCOVER:

1. Warranty trees and shrubs and groundcovers for a period of one (1) year following the date of final acceptance to be alive and in satisfactory growth at the end of the warranty period.
    a. Plants damaged or killed as a result of hail, winds over 75 miles per hour, lightning, fire, extreme drought conditions not typical of the planting area, winter kill caused by extreme cold and severe winter conditions not typical of the planting area, theft, vandalism, occupancy of the building, or Owner neglect of proper maintenance are not covered by the warranty.
2. Replacement:
    a. By the end of the guarantee period, any plant that is dead or 50 percent or more of the main branch structure dead, or not in satisfactory growth as determined by the Owner or the Landscape Architect, shall be removed from the site and shall be replaced.
    b. All replacements shall be plants of the same kind and size as specified in the plant list and shall be furnished and planted as originally specified.
    c. Cost of such replacements shall be borne by the Contractor.
    d. Replacement plants shall be guaranteed for one (1) year or as noted in the warranty.

e. Replacement shall be made within 10 days after notification, or as soon as weather conditions are satisfactory for planting.

PART 2 - PRODUCTS

2.01 SOIL ADDITIVES

A. Soil Conditioner: Compost, composted for a period of eight (8) weeks or longer, organic, derived from animal manure, wood shavings, hay, seed hulls, stable bedding, or other organic residue, without dust, objectionable odors, viable weed seed; aerobic and friable.
   1. A maximum of 10% cedar flakes/shavings is allowed in conditioner.
   2. Approved manufacturers:
      a. New Earth, San Antonio, Texas; (210) 661-5180.
      b. Gardenville, San Antonio, Texas, (210) 651-6115.

B. Fertilizer for Trees:
   1. Healthy Start 12-8-8 Macro Tabs; www.planthealthcare.com, John Deere Landscapes (210) 656-8100. No substitutions.

C. Fertilizer for Shrubs and Groundcovers:
   1. Fertilizer: Healthy Start 12-8-8 Macro Tabs (21 gram tablet); www.planthealthcare.com, John Deere Landscapes (210) 656-8100. No substitutions.

D. Biostimulant:
   1. Agri-Gro, manufactured by Agri-gro Marketing, Inc., distributed by Gardenville (210) 651-6115.

E. Herbicides:
   1. Pre-Emergence Weed Control (for use after cultivation): XL-2G by Dow Elanco or approved equal.
   2. Post-Emergence Herbicide: Round-Up by Monsanto Corp., or approved equal.

F. Mycchorizal Fungi Treatment:
   1. Mycor Tree Saver; www.planthealthcare.com, John Deere Landscapes (210) 656-8100.

2.02 PLANT MATERIALS

A. Plant Quantities:
   1. This project does not employ a unit price bid on contract.
   2. The quantities of plants calculated and shown on the plans and schedule defines only the general magnitude of plants required.
   3. The Contractor shall furnish the number of plants at the specified spacing required to accomplish the planting.

B. Plant Schedule: Refer to Plant Schedule indicating plant material, common and botanical name and size specifications indicated on the drawings.

C. Quality:
   1. Provide plant materials of size, genus, species and variety shown and scheduled for landscape work as per the following:
      a. Provide plants typical of their species or variety; with normal, densely-developed branches and vigorous, fibrous root systems.
      b. Provide only sound, healthy, vigorous plants free from defects, disfiguring knots, sunscald injuries, frost cracks, abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation.
      c. All plants shall have a fully developed form without voids and open spaces.
   2. Dig balled and burlapped plants with firm, natural balls of earth sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. Provide ball sizes complying with the latest edition of the “American Standard for Nursery Stock”.
      a. Cracked or mushroomed balls are not acceptable.
      b. Provide well-cured stock.

3. All plant materials and trees shall be nursery grown; field collected materials are not acceptable without prior approval of Landscape Architect.
4. All plant materials and trees shall be nursery grown; field collected materials are not acceptable.

D. Bare root plants are not acceptable.

E. Container Grown stock: Grown in a container for sufficient length of time for the root system to have developed to hold its soil together, firm and whole.
1. No plants shall be loose in the container.
2. Container stock shall not be pot bound.

F. Height of branching should bear a relationship to the size and variety of tree specified and with the crown in good balance with the trunk.
1. Trees shall not be “poled” or the leader removed.

G. Trunk shall be reasonably straight and symmetrical with crown and have a persistent main leader for single-stem trees.
1. For trees less than 4 inch caliper, caliper measurement is taken six (6) inches from top of root ball.
2. For trees 4 inch caliper and larger, caliper measurement is taken twelve (12) inches from top of root ball.
3. Provide tree species that mature at heights over 25'-0" with a single main trunk.

H. For multi-stem trees:
1. All countable stems, in aggregate, shall average the size specified as calculated by adding the caliper of the largest trunk to the average of the sum of the remaining/smaller trunks.
2. To be considered a stem, there should be no division of the trunk which branches more than six (6) inches from ground level.

I. For specimen trees, a plant shall be provided that is well branched and pruned naturally according to the species.
1. The form of growth desired, which may not be in accordance with natural growth habit, shall be as indicated.

J. Plants planted in rows shall be matched in form.

K. Plants larger than those specified in the plant list may be used when acceptable to the Landscape Architect.
1. If the use of larger plants is acceptable, increase the spread of roots or root ball in proportion to the size of the plant.
2. The height of the trees, measured from the crown of the roots to the top of the top branch, shall not be less than the minimum size designated in the plant list.
3. Shrubs and small plants shall equal or exceed the requirements for spread and height indicated in the plant list.
    a. The measurements for height shall be taken from the ground level (top of root ball) to the average height of the top of the plant and not the longest branch.
    b. Single stemmed or thin plants will not be accepted.
    c. Side branches shall be generous, well-twigged and the plant as a whole well-bushed to the ground.
    d. Plants shall be in a moist, vigorous condition, free from dead wood, bruises, or other root or branch injuries.

L. No pruning wounds shall be present with a diameter of more than one (1) inch and such wounds must show vigorous bark on all edges.

M. Matched: Plants labeled as matched on plans or plant schedule shall select stock chosen for uniform height, spread and general character; label with number to assure symmetry in planting.

N. Substitutions:
1. Permitted only upon submission of proof at least sixty (60) days prior to planting that the plant specified is not reasonably obtainable.
2. The substitution shall be authorized by the Owner or Landscape Architect by change order.

2.03 MISCELLANEOUS LANDSCAPE MATERIALS

A. Dress Mulch: Regular, single shredded, unscreened hardwood or approved equal.

B. Wound Dressing: Black enamel based spray paint or asphaltic based paint or tree wound paint such as Treeheal or Ortho.

C. Water:
   1. Furnished by the Contractor.
   2. Hose and other watering equipment to be provided by Contractor.

D. Soil Separation Fabric (Geotextile):
   1. Mirafi 140N as manufactured by TenCate, Pendergrass, Georgia (www.mirafi.com); tel. 800.685.9990 or approved equal.

E. Steel Edging:
   1. 10 gauge, 1/8" x 4" commercial steel edging fabricated in sections to receive stakes.
   2. Provide tapered steel stakes 16" long.
   3. Finish shall be manufacturer's standard green paint.

F. Aggregates:
   1. Decomposed Granite: Hard, durable particles or fragments of Texas Hill Country decayed granite gravel with fines evenly mixed throughout the aggregate, available from Keller Material, Inc., San Antonio, Texas, (210) 648-4221 or approved equal.
      a. Provide color samples for selection.
      b. Size gradation 1/4" to minus.
      c. Size gradation 1/8" to minus.
   2. Stone: Hard, durable stone, washed free of soil, sand, clay and other foreign substances. Provide the following stone, color and size range:
      a. As indicated on the drawings.
   3. Drainage Fill: AASHTON M43 #6 (3/8 to 3/4 inch) clean/washed uniformly graded stone or gravel.

G. Anti-Desiccant: Emulsion type, film forming agent designed to permit transpiration but retard excessive loss of moisture from plants.

H. Tree Guard: Arbor-Guard polyethylene with U.V. inhibitors (minimum eight inch high for up to four inch caliper tree) by Deep Root Corporation, Westminster, California, 714-898-0563 or approved equal.

I. Materials for Staking Trees:
   1. Stakes:
      a. Six (6) foot height studded steel T-posts with painted finish for rust protection.
   2. Guy Ties:
      a. Plastic Chain Ties: Adj-A-Tye, as manufactured by A.M. Leonard, Inc., Piqua, Ohio, or approved equal.
      b. Tree Ties: ARBOR TIE by Deep Root Partners, L.P. San Francisco, CA or Approved Equal.

PART 3 – EXECUTION

3.01 PLANTING DETAILS

A. Planting details regarding tree planting, shrub pit planting, shrub and groundcover planting, and planting bed soil preparations are included on the drawings.

3.02 PLANTING

A. Layout individual tree and shrub plantings.
   1. Stake tree and shrub locations.
   2. The Landscape Architect reserves the right to inspect all layouts prior to the start of, during, and after planting work.
   3. Make adjustments as may be requested at no additional cost to the contract.

B. Layout plant material and planting bed locations before preparing beds .
   1. The Landscape Architect reserves the right to adjust plant material locations prior to the start of, during, and after planting work at no additional cost to the contract.
   2. Do not plant closer than ½ the placement spacing distance of the particular plant variety indicated in the plant schedule to a building wall, pavement edge, fence or wall edge and other similar structures.

C. Set plant material in the planting pit to proper grade and alignment.
   1. Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structure.
   2. No filling will be permitted directly over root ball or around trunks or stems.
   3. Do not use frozen or muddy mixtures for backfilling.
   4. Form a ring of soil around the edge of each planting pit to retain water.

D. After plants are in place, muddle planting soil mixture around sides of balls and fill all voids.

E. Prior to backfilling with planting soil mixture, remove all burlap, ropes, and wires from the top 1/3 of balls on all balled and burlapped plant material.

3.03 PLANTING GROUND COVER AND SHRUBS IN BEDS

A. Space ground cover plants in accordance with indicated dimensions providing the quantity of plants necessary to evenly fill planting bed area.
   1. Plant layout is to be equidistantly triangular spaced.
   2. Plant to within 12 inches of the trunks of trees and shrubs within planting bed and to within 6 inches of edge of bed but in no instance less than ½ the spacing distance of the plant.

B. All plant material shall be set at a level that, after settlement, they shall bear the same relationship to the finish grade that they bore to the soil from which they were dug/grown.

C. When plants are set at proper elevation, planting soil shall be replaced around the ball and compacted, avoiding injury to the roots and filling all voids.
   1. Absolutely no topsoil or planting soil shall be placed over top of any rootball or portion of rootball.

D. Place fertilizer tablets, at rate shown in table under fertilization section, when approximately half the backfill is in place.

E. Planting beds shall be raked smooth and thoroughly watered and then water allowed to soak away.

F. After settlement, add planting soil as necessary to bring bed to finish grade and again thoroughly water entire plant bed.

G. After planting operation and prior to mulching, pre-emergent weed control shall be applied to the entire bed area according the manufacturer's recommendations.

H. Prune, thin out and shape shrubs in accordance with Standard Horticultural Practice if deemed necessary by Landscape Architect.
   1. Prune shrubs to retain natural character.
   2. Pruning shall be limited to the minimum necessary to remove injured twigs and branches.

I. Following a minimum two (2) week waiting period after planting is completed, all beds shall be inspected by the Contractor and treated as required with an appropriate post-emergent herbicide to remove weed growth.
   1. Treatment shall be continued as necessary to remove weeds.
   2. No beds shall be accepted with weeds.

3.04 PREPARATION FOR SHRUB AND TREE PITS

A. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
   1. Minimum diameter of planting pit is twice the diameter of the rootball.

B. Shrubs, Multi-Trunk Trees and Trees Under 2-1/2" Caliper:
   1. Minimum depth allows rootballs (containers) to sit on 6 inches of compacted planting mixture with top of ball (container) flush with finish soil grade.
   2. Minimum diameter is twice the diameter of rootball or size pit to receive rootball.

C. Trees 2-1/2" Caliper and Over:
   1. Minimum depth allows rootballs to sit on pit bottom with top of ball 2 to 3 inches above finish soil grade.
   2. Minimum diameter is twice the diameter of the rootball or size pit to receive rootball.

D. Utilize excavated parent soil in the backfill mixture in the planting pit for trees.
   1. The parent soil is to be mixed at a 70:30 ratio with the soil conditioner specified in this section.

E. Prior to planting, fill excavations for trees and shrubs with water and allow to percolate out before planting.
   1. Provide drainage holes if water does not percolate from pit within a 24 hour period after filling per the following:
      a. Where tree pits are dug in rock, a 4-inch diameter drainage hole will be drilled to drainage material or rock fracture and filled with gravel.
      b. Where tree pits are dug in clay, a 4-inch diameter drainage hole will be drilled to drain and backfill with gravel when required to insure proper drainage.
   2. The drain hole must meet the test of draining the pit filled with water within a 24 hour period of time.
   3. Additional drain holes shall be drilled if required to meet drainage test herein described.
   4. Prior to planting tree place soil separation fabric over drainage holes.

3.05 PLANTING SHRUBS AND TREES IN PITS

A. Elevation:
   1. Set shrubs at a level so that, after settlement, they shall bear the same relationship to the finished grade of the surrounding soil from which they were dug or from the container they were grown in.
   2. Set trees to place top of root ball 2 to 3 inches above finish grade.

B. Setting Plants:
   1. After placing the plant in the specified pit, planting soil shall be placed around the ball and compacted to avoid injury to the roots and to fill all voids.
   2. When pits are nearly filled with soil, add water and allow to soak away.
   3. Fill the pit to finished grade with planting soil allowing for mulching material.
   4. Form a shallow saucer around each plant by placing a ridge of planting soil around the edge of each pit to retain water.

C. Backfill Material:
   1. Utilize excavated parent soil in the backfill mixture of the planting pit. Mix parent soil at 70:30 ratio with soil conditioner.
   2. The Backfill Material shall contain both backfill mixture as specified and Mycchorizal Fungi Treatment.
   3. Mycchorizal Fungi Treatment to be used shall be submitted to the Landscape Architect not less than 2 weeks prior to the treatments intended use.
   4. Mycchorizal Fungi Treatment not approved by the Landscape Architect shall not be used.

D. Absolutely no topsoil or planting mixture shall be placed over top of rootball.

E. Do not set trees and shrubs plumb by adjusting the ball.

F. When plants are set at proper elevation, planting soil shall be replaced around the ball and compacted, avoiding injury to the roots and filling all voids.

G. Place fertilizer tablets in planting of shrubs, at rate shown in table under fertilization section, when approximately half the backfill is in place.

H. Planting pits shall be raked smooth and thoroughly watered and then water allowed to soak away.

I. After planting operation and prior to mulching, pre-emergent weed control shall be applied to the entire pit/basin area according the manufacturer's recommendations.

J. When pit planted plants are in a mass two or more rows in depth, the entire bed area shall be receive pre-emergent herbicide and mulch as specified for planting beds.

K. Prune, thin out and shape trees and shrubs in accordance with standard horticultural practice.
   1. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches, if any.
   2. Prune shrubs to retain natural character.
   3. Cuts on plants over 3/4-inch in diameter to be cut back to sound tissue, smoothed and shaped so as not to hold rain water and painted with an approved tree wound paint.
   4. Remove and replace excessively pruned or misformed stock resulting from improper pruning.

L. Maintain a minimum 3'-0" diameter saucer at base of trees within turf/grass areas clear of any grass.

M. All tree and shrub pits are to receive a treatment of pre-emergent herbicide just prior to placement of mulch.

N. Staking trees:
   1. Stake trees immediately after planting.
      a. Only when required to maintain a plumb condition due to wind, weight of plant material, etc.
   2. Under no circumstances is a tree to be plumbed with extreme tautness of guy ties.
   3. Locate and drive stakes at equal spaced intervals outside the tree pit(s).
      a. Provide wire ties from each stake to encircle trunk at 40% to 50% of the tree's height.
      b. Encase tie wire at tree in rubber hose.
      c. Slightly tighten wire tie to hold trunk firmly, but under no circumstances is tree to be plumbed by extreme tautness of ties.
      d. Provide 3- stakes when required to keep trees plumb on slopes or in varying wind conditions.

O. PVC Tree Guard: Provide tree guards at all trees located within turf/grass areas.

3.06 FERTILIZATION OF TREES

A. Accomplish fertilization of trees after soil preparation work is complete.

B. When plant pit has been backfilled 50% place fertilizer tablets, equally spaced around rootball in accordance with the following schedule:
   1. 10 gallon 4 tablets
   2. 15 gallon 5 tablets
   3. 20-24 inch rootball 5 tablets
   4. 30-36 inch rootball 6 tablets
   5. 42-48 inch rootball 8 tablets
   6. 54-60 inch rootball 10 tablets
   7. Larger SizeFor each 1/2 caliper, use 2 tablets

C. Area beneath dripline of the trees is to be well watered after the fertilization is placed.

3.07 FERTILIZATION FOR SHRUBS AND GROUND COVER

A. For Shrubs and Ground Cover: When plant pit has been backfilled 50% place fertilizer tablets, equally spaced around rootball in accordance with the following schedule:
   1. 1 gallon 1 tablet
   2. 3 gallon 2 tablets
   3. 5 gallon 3 tablets
   4. 10 gallon 4 tablets

3.08 MULCHING:

A. Dress Mulching:
   1. Within two days after planting not less than four (4) inches of dress mulch shall be placed on entire area of planting beds, and not less than four (4) inches over shrub and tree pits.
   2. Keep mulch six (6) inches away from tree trunk.

3.09 RECONDITIONING EXISTING PLANTING BEDS

A. Recondition existing planting beds to remain and any existing beds damaged by Contractor's operations including storage of materials and equipment and movement of vehicles.
   1. Replace any plantings damaged to restore the beds to the satisfaction of the Landscape Architect.
   2. Remove weeds from all existing beds; apply pre-emergent herbicide and dress mulching as here before specified.
   3. Work shall conform with all requirements of this Section.
      a. Apply Mycchorizal Fungi Treatment and Fertilizer.

3.10 MISCELLANEOUS LANDSCAPE WORK

A. Steel Edging:
   1. Install steel edging where shown.
   2. Anchor with steel stakes spaced not more than 3 feet o.c., and driven at least 1 inch below top elevation of edging or as directed by manufacturer.
   3. Provide edged to separate bed areas and turf/grass areas.

B. Aggregate Mulch:
   1. Place aggregate beds where shown.
   2. Compact soil subgrades before placing aggregate.
   3. Place soil separation fabric over compacted subgrade prior to placing aggregate.
   4. Place aggregate over entire area as indicated, rake smooth using steel tine rake to grade and cross section as indicated.

C. Decomposed Granite:
   1. Place decomposed granite over entire area as indicated, rake smooth using steel tine rake to grade and cross section as indicated.
   2. Compact soil subgrades before placing decomposed granite.
   3. Place soil separation fabric over compacted subgrade prior to placing decomposed granite.
   4. Place decomposed granite over entire area of the tree well or as indicated, rake smooth using steel tine rake to grade and cross section as indicated.
   5. Place to avoid segregation of aggregate.
   6. Compact to 80-85% maximum dry density.

3.11 MAINTENANCE

A. Begin maintenance immediately after each plant is planted. Maintenance shall continue until final acceptance of the project unless indicated otherwise. Refer to Section 32 93 10 - LANDSCAPE MAINTENANCE.

3.12 RECORD DRAWINGS

A. The Contractor shall keep up-to-date, a complete "as-built" record set of blueline prints, corrected daily, showing any change from the original plans and indicating horizontal and vertical locations referenced to permanent surface improvements.
   1. Identify field changes of dimension and detail and changes made by Change Order.
   2. Upon completion of the project, provide the Landscape Architect with the "as-built" record drawings of changes to the work.
      a. The changes shall be recorded in a legible and workman-like manner on a reproducible mylar or vellum.

3.13 CLEANUP AND PROTECTION

A. During landscape work, all rope, wire, burlap, empty containers, rocks, clods and other debris, shall be removed daily and the site kept neat at all times.

B. Any excess excavated subsoil or topsoil shall be removed from the site.

C. After planting operations are finished, all paved areas which may have become strewn with soil or other material shall be thoroughly cleaned by sweeping, and if necessary, power washing.

D. Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades and trespassers.
   1. Maintain protection during installation and maintenance periods.
   2. Treat, repair or replace damaged landscape work as directed.

3.14 INSPECTION AND ACCEPTANCE

A. Immediately prior to request for Substantial Completion, inspect the work and replace all materials or portions of the construction that are damaged, defaced, eroded, or in any manner does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by Landscape Architect and found to be acceptable.

B. When Contractor considers work or designated portion of the work is substantially complete, submit: 1) request for Substantial Completion inspection with a list of items to be completed or corrected, one of which shall not be cleaning, 2) Record Documents as required below, and 3) written certification that Contract Documents have been reviewed, work has been inspected and that work is complete in accordance with Contract Documents.

C. Submit to Landscape Architect with written request for review Certificate of Occupancy or evidence that request for Certificate of Occupancy has been sent to the authority having jurisdiction and that Certificate of Occupancy has been denied or is being withheld through no fault of the Contractor.

D. After receipt of required submittals, Landscape Architect will schedule inspection.

E. Should Landscape Architect review find work that is not substantially complete, he will promptly notify Contractor in writing, listing observed deficiencies.

F. Contractor shall remedy deficiencies and send a second written notice for review.

G. Landscape Architect will re-review the work.

H. When Landscape Architect finds work is substantially complete, he will prepare a Certificate of Substantial Completion in accordance with provisions of General Conditions with a revised tentative list of items to be completed or corrected (punch list).

I. Complete modifications or corrections required by punch list within 14 days from date of receipt of punch list.

J. If the Architect is required to make multiple trips to the site because the Contractor's claims exceed the project's state of completion:
   1. the Owner will pay the Landscape Architect for each additional trip as an additional service in accordance with the requirements of the Architect / Owner Agreement,
   2. and an equal amount will be deducted from contract amount as reimbursement to the Owner.

END OF SECTION

SECTION 32 9310

LANDSCAPE MAINTENANCE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Maintenance of the landscape to be provided.

1.02 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
   1. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
   2. ANSI Z60.1(1990)Nursery Stock.
   3. ANSI Z133.1(1994) Tree Care Operations- Pruning, Trimming, Repairing, Maintaining, and Removing Trees and Cutting Brush.
   4. ANSI A300(1995)Tree, Shrub and Other Woody Plant Maintenance- Standard Practices.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Section 32 9223 - Sodding

B. Section 32 9219 - Seeding

C. Section 31 1330 - Treatment of Existing Trees

1.04 QUALITY ASSURANCE

A. Landscape maintenance must be supervised by a staff member of the Contractor who possesses at least one of the following:
   1. Certified Landscape Professional Contractor (CLPC) as administered by Texas Association of Landscape Contractors (TALC).
   2. College degree relating to the landscape industry or an approved equivalent.

B. Employ a degreed botanist or plant biologist/consultant to provide oversight of establishment of native grass and wildflower areas.
   1. Consultant shall monitor and direct establishment operation through Final Acceptance of Project.

1.05 JOB CONDITIONS

A. Maintenance operations shall be conducted under favorable weather conditions during the seasons which are normal for such work as determined by acceptable practice in the locality.

B. Maintenance Operations:
   1. Conduct maintenance for a minimum 90 day period after all planting is completed (Substantial Completion) in its entirety prior to final acceptance.

PART 2 - PRODUCTS

2.01 MATERIALS- REFER TO RESPECTIVE LANDSCAPE SECTIONS FOR APPLICABLE MATERIALS.

PART 3 - EXECUTION

3.01 GENERAL

A. Obtain and follow the maintenance instructions provided by the installer of new plant materials.

B. General Cleanup:
   1. Remove debris from all landscape areas at least once a week.
   2. Remove debris from maintained turf areas (area at upper level adjacent Huebner egress ramp) at before each mowing.
   3. Debris consists of trash, rubbish, dropped leaves, downed branches and limbs of all sizes, dead vegetation, rocks, and other material not belonging in landscaped areas.
   4. Remove debris from site and dispose of properly.

C. Watering, Soil Erosion, and Sedimentation Control: Comply with Federal, state, local, and other regulations in force; prevent over-watering, run-off, erosion, puddling, and ponding.
   1. Repair temporary erosion control mechanisms provided by others.
   2. Repair eroded areas and replant, when caused by inadequate maintenance.
   3. Prevent sediment from entering storm drains.

D. Trees:
   1. Exercise care to avoid girdling trees.
   2. Provide protective collars.
   3. Remove protective collars at end of maintenance period.

E. Fertilizing: Apply fertilizer only when necessary or as indicated.

F. Earth Mound Watering Basins: Maintain in good condition and as required to permit efficient application of water without waste; reapply mulch if soil surface shows.

G. Drainage Channels: Remove obstructions in gutters, catch basins, storm drain inlets, yard drains, swales, ditches, and overflows.

H. Health Maintenance: Inspect all plants regularly for health:
   1. Eradicate diseases and damaging pests, regardless of severity or speed of effect.
   2. Treat accidental injuries and abrasions.
   3. If a plant is unhealthy but not yet dead, according to specified definitions, determine reason(s) and take remedial action immediately.
   4. Remove dead plants immediately upon determining that they are dead.

I. Pesticide and Herbicide Application: Comply with manufacturer's instructions and recommendations and applicable regulations.
   1. Obtain Owner's approval prior to each application.
   2. Apply in manner to prevent injury to personnel and damage to property due to either direct spray or drifting, both on and off Owner's property.
   3. Use backflow preventers on hose bibbs used for mixing water; prevent spills.
   4. Inspect equipment daily before application; repair leaks, clogs, wear, and damage.
   5. Do not dispose of excess mixed material, unmixed material, containers, residue, rinse water, or contaminated articles on site; dispose of off site in legal manner.
   6. Rinse water may be used as mix water for next batch of same formulation.
   7. Contractor is responsible for all recordkeeping, submissions, and reports required by laws and regulations.

3.02 MAINTENANCE

A. Maintain trees, shrubs and other plants by pruning removal of dead wood, cultivating, watering, weeding and mulching as required for normal, healthy growth.
   1. Restore planting saucers.
   2. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required.
   3. Spray as required to keep trees and shrubs free of insects and disease.
   4. Water until Final Acceptance to provide 1 inch water per week.
      a. period requires equivalent of 4- 5 gallon buckets of water minimum per week.

B. Maintain turf/grass areas by watering, fertilizing, weeding, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable grass stand, free of eroded or bare areas (total bare area no greater than 2 percent of total area).
   1. Mowing at maintained turf areas shall be accomplished to maintain grass at a 1-3/8- to 1½-inch height for hybrid Bermuda species.
      a. Mowing shall not remove more than 1/3 height of the grass at each mowing.
      b. Native grass and wildflower areas are not to be mowed.
   2. Water turf/grass areas until Final Acceptance of project (no shorter than 90 day minimum maintenance period after Substantial Completion.)
   3. Water to provide an equivalent of 1 inch water per week minimum as required for the establishment of all turf/grass areas to the satisfaction of the Owner's Representative.

4. Keep turf relatively free of thatch, woody plant roots, diseases, nematodes, soil-borne insects, stones larger than 1-1/2 inches in diameter, and other materials detrimental to grass growth.
5. Limit broadleaf weeds and patches of foreign grass to a maximum of 2 percent of the total area.
    a. Apply appropriate post emergent turf herbicide per recommendations of manufacturer as neccessary to eliminate johnsongrass, yellow nutsedge, purple nutsedge, tall fescue and other weeds as listed by manufacturer.
    b. Schedule:
        1) Maintained Turf/Grass Areas (hybrid Bermudagrass): Spot Treatment herbicide and selective herbicide.
        2) Native Grass/Wildflower Areas: Spot Treatment herbicide only.

C. Fertilize areas within the project limits:
1. Turf/Grass Areas: 30 days following initial installation at rate to provide 1# nitrogen/1000 s.f.
2. Native Grass and Wildflower Areas: Not applicable.

D. Apply biostimulant to areas within the project limits:
1. Turf/Grass Areas: 30 - 45 days following initial application.
2. Native Grass and Wildflower Areas: 45 - 60 days following initial application.
3. Water in after application.

3.03 CLEANUP AND PROTECTION

A. Protect existing vegetation, pavements, and facilities from damage due to maintenance activities; restore damaged items to original condition or replace, at no extra cost to Owner.

B. Clean adjacent pavements of plant debris and other debris generated by maintenance activities.

C. Remove and dispose of general cleanup debris and biodegradable debris in a proper manner.
1. Biodegradable Debris: Owner's Representative's trash collection facilities may not be used; dispose of off site in accordance with applicable regulations.
2. Non-Biodegradable Debris: Owner's Representative's trash collection facilities may not be used; dispose of off site in accordance with applicable regulations.

D. During maintenance period, all debris shall be removed daily and the site kept neat at all times.

E. After maintenance operations are finished, all paved areas which may have become strewn with soil or other material shall be thoroughly cleaned by sweeping, and if necessary, power washing.

F. Protect landscape work from damage due to maintenance operations, operations by other contractors and trades and trespassers.
1. Treat, repair or replace damaged landscape work as directed.

3.04 INSPECTION AND ACCEPTANCE

A. When maintenance period is complete, Owner's Representative will, upon written request by the Contractor, make an inspection to determine acceptability.

B. Where inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by the Owner's Representative and found to be acceptable.

END OF SECTION

ADDENDUM REVIEWED & APPROVED BY:

CIMS Project Manager **Stacy Gonzales** **Date 06/1/2012**

NOTICE TO PLANHOLDERS:

Please insert this Addendum into your copy of the Project Construction Documents.

CITY OF SAN ANTONIO
DEPARTMENT OF CAPITAL IMPROVEMENTS MANAGEMENT SERVICES
CONTRACT SERVICES DIVISION

RECEIPT OF ADDENDUM NUMBER(S) **3** IS HEREBY ACKNOWLEDGED FOR PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF: **Frio Bulky Waste Collection Center** FOR WHICH BIDS WILL BE OPENED ON **Tuesday June 5, 2012 at 2:00 PM**

THIS ACKNOWLEDGEMENT MUST BE SIGNED AND RETURNED WITH THE BID PACKAGE.

Company Name: _____

Address: _____

City/State/Zip Code: _____

Date: _____

_____
Signature

_____
Print Name/Title